Efficient Cost Review of Port Services to Cruise Ships

Public Report

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Executive Summary

IPART was asked by the NSW Government to recommend the maximum usage charges that the Port Authority of NSW (the Port Authority) may levy on cruise ships for using the Overseas Passenger Terminal (OPT), White Bay and other berths and moorings in Sydney Harbour. AECOM was contracted to assist IPART by determining the efficient operating costs of services provided to cruise ships, the efficiency of proposed capital expenditure, and recommending an appropriate transition path for the Port Authority to achieve cost efficiency.

This document is AECOM's report to IPART in response to the brief issued by IPART. It presents findings in relation to the assets used by the Port Authority to provide its services to cruise shipping, the costs involved in delivering those services, and the basis used by the Port Authority to determine charges for its services.

The review was largely a desktop study using data provided by the Port Authority using templates developed by IPART, supplemented by a comprehensive set of reference documents (as listed in Appendix A). Issues identified during initial reviews were the subject of requests for further information delivered to the Port Authority via IPART, and in many cases were followed up in a series of workshops involving Port Authority, IPART and AECOM staff. Inspections were undertaken of selected assets in order to determine or confirm current condition in order to assess whole of life cost projections or remaining service lives and establish asset value. Asset valuations were undertaken by experienced cost estimators, who also used an extensive in-house database of current asset costs, service lives and whole-of-life costs to benchmark the costs budgeted by the Port Authority.

A number of changes have been recommended in relation to the value of the assets employed by the Port Authority in delivering services to cruise ships, resulting in a recommended reduction in the asset base originally proposed by the Port Authority. This would translate to lower charges through lower depreciation provisions. The asset base was otherwise, however, considered to be efficient.

The Port Authority has recently completed a major upgrade of the Overseas Passenger Terminal, increasing its capacity to enable larger cruise ships to visit Sydney and use the Terminal. A low level of capital works is planned for the next five year period to further augment the Port Authority's services. The individual projects and the total value involved seem reasonable and we recommend that this program be accepted.

Operating costs were reviewed and generally accepted on the basis that the Port Authority has had a successful efficiency program in place since 2014. We have reviewed the basis for the channel fee charged by RMS and passed on by the Port Authority. We have not been able to justify the level of fee charged by RMS.

We have concluded that the method used by the Port Authority to develop charges from its cost structure is overly complex. The Port Authority carries risk that it is not equipped to manage by virtue of the site occupancy charge currently in place. The charging system indicates an implied subsidy of smaller vessels by larger ones, which based on the terms of reference provided by IPART, we have concluded is not warranted.

The Overseas Passenger Terminal is likely to reach full capacity during the next five years, and it is not clear how the steady increase in patronage by vessels unable to pass under the Harbour Bridge will be accommodated. Since plans for a second berth for these vessels are not well advanced and it seems unlikely that another berth can be made available in time, we have suggested that the Overseas Passenger Terminal be moved to a 12-hour slot booking system rather than the current 24-hour slots. We anticipate that this would enable the need for a second wharf to be deferred several years (depending on demand growth), giving Sydney enough time to develop a solution.

Both the Overseas Passenger Terminal and the White Bay Cruise Terminal could be utilised at full capacity as soon as 2020, depending on the actual increase in demand experienced. Since the Port Authority is primarily a fixed cost business, and utilisation is determined vessels occupying the berths (not the number of passengers), we have suggested that IPART determine a charging mechanism appropriate for a state of full utilisation, and also determine interim arrangements if necessary.

1.0 Introduction

IPART was asked by the NSW Government[1] to conduct a review and make recommendations on the maximum usage charges that the Port Authority of NSW (the Port Authority) may levy on cruise ships for using the Overseas Passenger Terminal (OPT), White Bay and other berths and moorings in Sydney Harbour.

In order to satisfy its Terms of Reference, IPART contracted AECOM to determine the efficient operating costs of services provided to cruise ships, assess the efficiency of proposed capital expenditure, and recommend an appropriate transition path for the Port Authority to achieve cost efficiency.

This document is AECOM's report to IPART in response to the brief issued by IPART. It presents findings in relation to the assets used by the Port Authority to provide its services to cruise shipping, the costs involved in delivering those services, and the basis used by the Port Authority to determine charges for its services.

1.1 Context

The Port Authority is a state-owned corporation that provides three main services to cruise ships in Sydney Harbour, for which it levies compulsory charges. These services include:

- Use of one of three berths and two passenger terminals;
- Navigation services (including emergency management services);
- Pilotage.

The Port Authority also provides mooring in Sydney Harbour using seabeds, channels and berthing assets that are owned by Roads and Maritime Services NSW (RMS) and provided to the Port Authority under agreement (for its non-exclusive use). The Port Authority provides various other services that are charged separately, some of which are outsourced to third parties for delivery.

About 60% of cruise shipping is accommodated at the Overseas Passenger Terminal (OPT). The remainder use the White Bay Cruise Terminal (WBCT) or Berth 4 at White Bay if necessary. Current practice is that the OPT is reserved for use by cruise ships that are unable to pass under the Sydney Harbour Bridge, and used by other ships only if the berth is available. Ships able to pass under the Bridge are generally berthed at the WBCT.

Approximately 10% of all cruise ship calls made to Sydney are visits by long distance (international) ships, which bring passengers to experience the city and region and therefore tend to be alongside for longer periods than other ships. The remainder are 'home port' ships that embark and disembark passengers in Sydney, re-provision while berthed, and tend to turnaround relatively quickly.

Ships with a sufficiently qualified master are exempt from the requirement to use a Port Authority pilot, but in practice all cruise ships using Sydney Harbour have so far made use of the pilotage service.

1.2 Terms of Reference

The scope of work issued by IPART required this review to:

- Determine the efficient operating cost (by assessing operating and maintenance expenditure from a least-cost perspective over the life-cycle of the assets) for cruise ship services including site occupancy, navigation and pilotage for the 6 year period from 2015-16 to 2020-21, taking into account required quality and safety standards.
- Assess the efficiency of proposed capital expenditure over the period.
- Recommend an appropriate transition path(s) to achieving cost efficiency (if required) for each service.
- Determine the efficient initial capital base for services provided to cruise ships.

[1] Terms of Reference issued on 11 December 2015

In making these assessments, the review was required to apply a number of principles intended to drive economically efficient service outcomes. These principles include:

- Efficient pricing (prices are cost reflective, forward looking and provide signals to customers as to the costs of future investment in infrastructure to meet changes in demand);
- Revenue adequacy (prices cover the costs of producing and delivering services, including a return on capital invested, and reflect consideration of business risk. Prices may be set using a combination of variable charges and fixed charges);
- Equity (generally to ensure that there is no cost subsidisation of one customer group by another);
- Consideration of environmental and resource impact (the influence of price on consumer behaviour, the flow-on impacts on the environment and the use of scarce resources if relevant);
- Administrative practicality.

Benchmarking was required in relation to peer organisations where appropriate and possible.

1.3 Approach and Methodology

The review was largely a desktop study using data provided by the Port Authority using templates developed by IPART, supplemented by a comprehensive set of reference documents (these are listed in Appendix A).

Issues identified during initial reviews were the subject of requests for further information delivered to the Port Authority via IPART, and in many cases were followed up in a series of workshops involving Port Authority, IPART and AECOM staff.

Inspections were undertaken of selected assets in order to determine or confirm current condition in order to assess whole of life cost projections or remaining service lives and establish asset value.

Asset valuations were undertaken by experienced cost estimators, who also used an extensive in-house database of current asset costs, service lives and whole-of-life costs to benchmark the costs budgeted by the Port Authority.

The review team included:

- Business consultants with experience in similar reviews of service pricing, and in assessing opportunities for performance improvement;
- Financial analysts;
- Qualified cost estimators and valuers;
- A range of qualified engineers, including structural, building and marine engineers.

2.0 Services Provided to Cruise Ships

Cruise ships are served in Sydney Harbour in several ways. The Port Authority provides:

- **Pilotage** for all commercial vessels using the Harbour (vessels >30m Length Overall);
- **Navigation** services, including navigation aids and emergency response facilities for all vessels;
- **Berthing** facilities at the Overseas Passenger Terminal for those vessels that are unable to pass under the Harbour Bridge, and at the White Bay Cruise Terminal for those that can. A second berth is available at White Bay berth 4 when necessary, and is shared with other commercial vessels. The Port Authority provides access to vessels, security and related services at the terminals.

  There are also mooring facilities in the Harbour.

The cruise operators obtain provisioning, bunkering and other services directly from third party service providers. The Port Authority facilitates certain other services on behalf of the cruise operators, including security, supply of potable water, cleaning and berth insurance. Security is required in all cases, but the other services are provided as required on an ad hoc basis. The revenue from these is a minor part of Port Authority revenues.

Charges for these services are currently based on:

- Vessel tonnage for navigation charges;
- Vessel tonnage using four tonnage bands for pilotage (and a fixed boarding fee);
- Passenger numbers above a minimum of 1,200 (for site occupancy charges).

2.1 Cruise Ship Activity in 2015-2016

During the 2015-16 year there were 303 calls by cruise ships at cruise terminals in Sydney Harbour, the majority (58%) using the Overseas Passenger Terminal.

Although there are four tonnage tiers currently used for charging for Pilotage services in the Harbour, in practice 93% of the cruise ships that called during the period had a gross tonnage greater than 55,000 gross tonnes, which is the highest band (Figure 1).

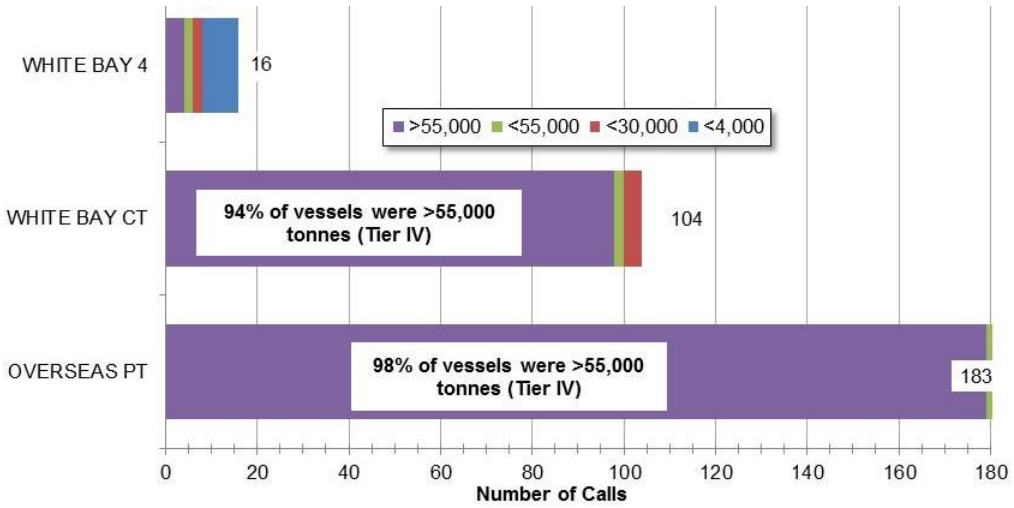

Figure 1 Vessel numbers during 2015-16 by Tonnage Band

Berthing charges are currently based on passenger numbers (excluding infants), with a fixed charge applied for vessels with 1,200 passengers or less. During the 2015-16 year, less than 3% of all calls were made by vessels with less than 1,200 passengers, only one of which berthed at the Overseas Passenger Terminal.

The distribution of calls by Terminal by passenger numbers during 2015-16 is indicated in Figure 2.

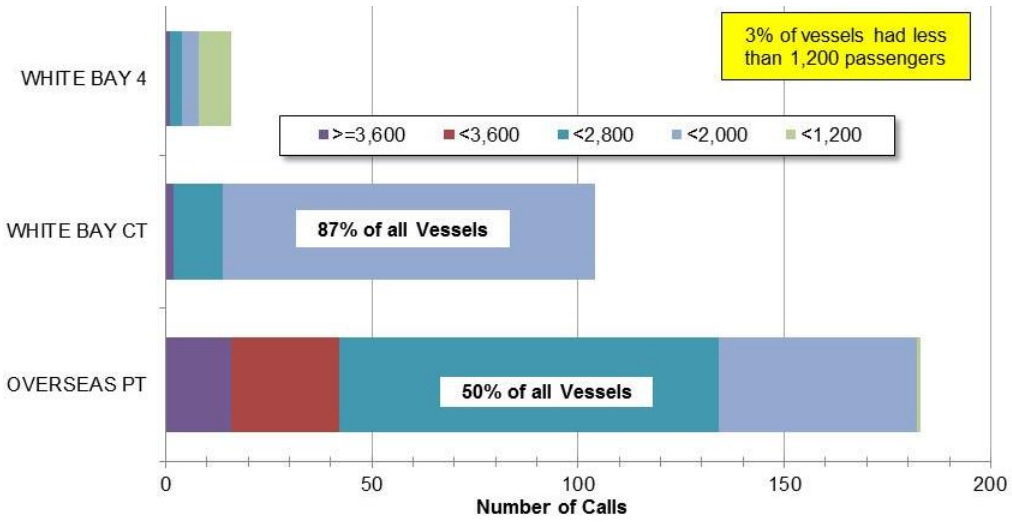

Figure 2 Passenger numbers per call during 2015-16 by Terminal

The cruise industry is seasonal, with a peak season for home port vessels around the Christmas holiday period, and for international vessels slightly later, corresponding with mid-summer in Australia. Demand for berths is therefore greater during the December to March period.

Approximately 90% of all calls during the period were home port vessels. These vessels were effectively full to capacity during the peak period, with typical vessel occupancy running at an average of 97% during peak season (Figure 3). The industry makes every attempt to fill vacant cabins, often offering heavy discounts. The implication is that there is very little capacity to accommodate further increases in passenger demand during the season using the current fleet, and that if demand continues to increase, larger vessels and/or additional vessels will be required.

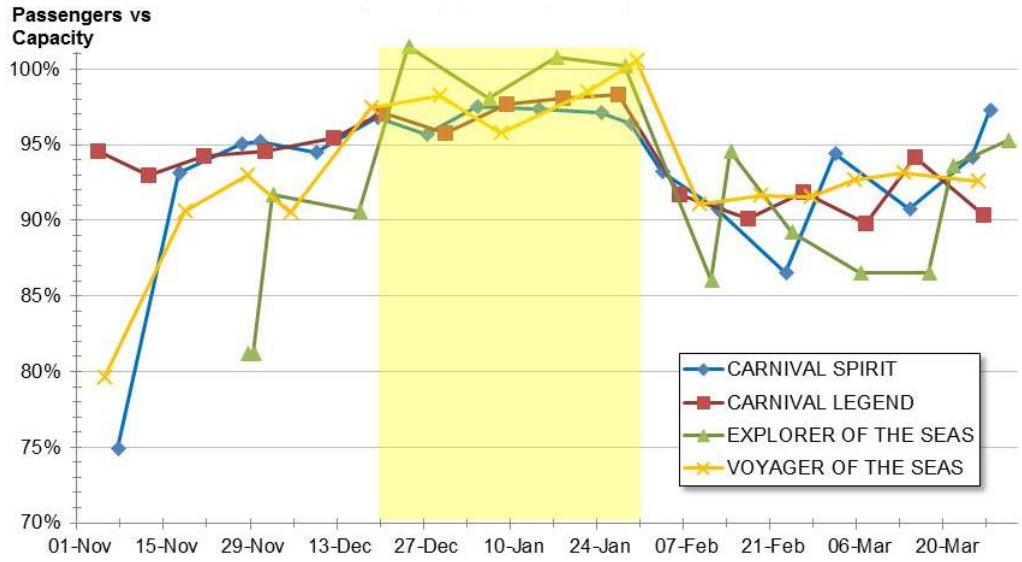

Figure 3 Utilisation of home port vessels using the Overseas Passenger Terminal during peak season 2015-16 (sample of vessels)

Access to the Terminals is restricted – only one vessel is able to berth at one time (except for the smallest vessels, and in practice two vessels were berthed simultaneously at the Overseas Passenger Terminal only once in 2015-16). The Port Authority's practice is to reserve the Overseas Passenger Terminal for vessels that are not able to pass under the Harbour Bridge, so smaller vessels are only able to use that Terminal if it is scheduled to be vacant at that time. Bookings are currently done in 24-hour slots at all Terminals, although the Port Authority currently has proposals to modify this policy to make it more flexible.

Slot usage at the Terminals during the period peaked during January, when there were only 3 unused 24-hour slots at the Overseas Passenger Terminal (Figure 4). White Bay Cruise Terminal was only utilised to about 50% of its capacity.

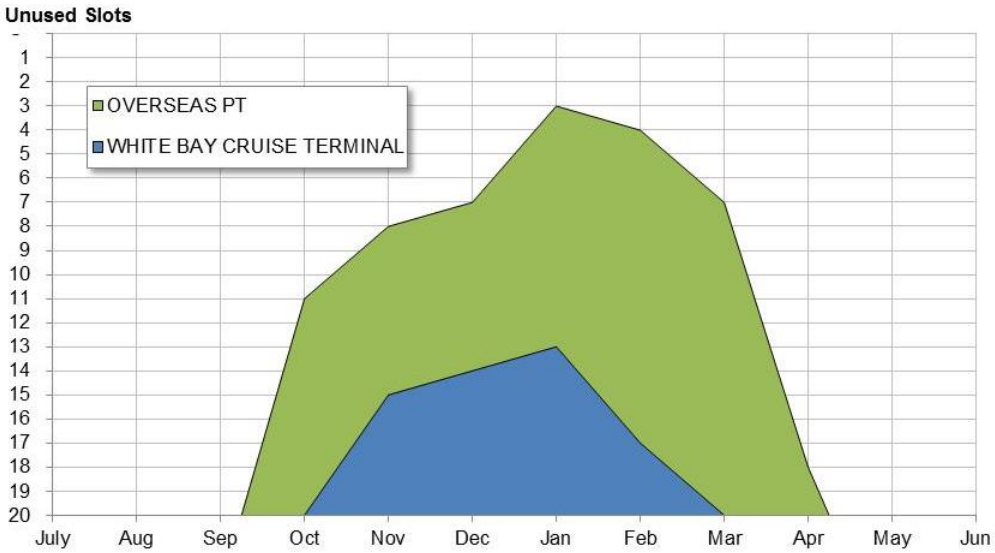

Figure 4 Unused slots by month by terminal during 2015-16

Of the calls that berthed at the Overseas Passenger Terminal during the period, 52% were alongside for less than 12 hours, but were charged for the 24-hour slot (Figure 5). 91% of vessels using the White Bay Cruise Terminal were alongside for less than 12 hours.

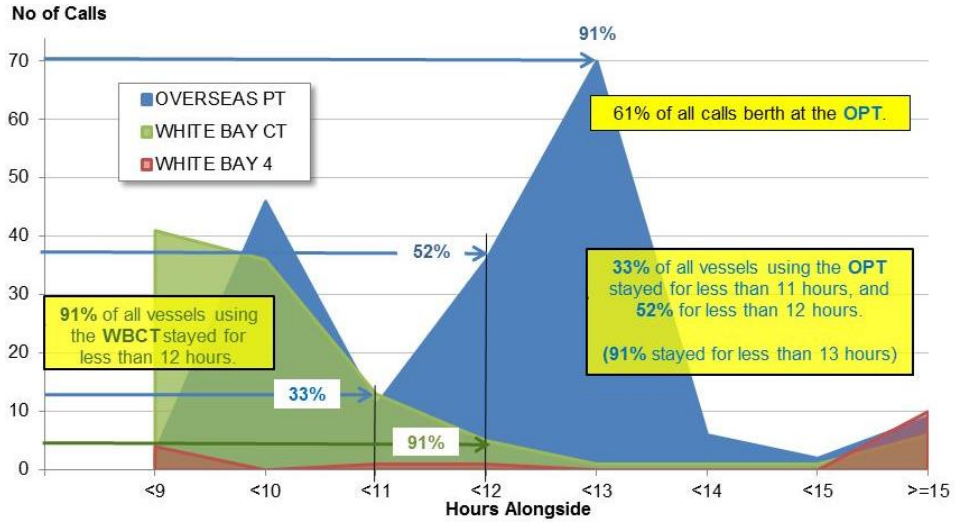

Figure 5 Berth occupancy by Terminal during 2015-16

We note that *Explorer of the Seas*, currently the largest vessel to home port in Sydney, operates from Seattle during the Australian winter. It schedules 10 hour turnarounds there, but averages 12.3 hour turnarounds in Sydney. We are not aware of the reasons for the extended time alongside in Sydney, but the implication is that there may be an opportunity to reduce turnaround times at the Overseas Passenger Terminal by up to 20%.

Given the demand for access to the Terminal, reducing turnaround time to around 10 hours could enable a second 12 hour slot to be used.

2.2 Demand Projections for the 2017-2021 Period

Sydney Harbour is in increasing demand by the cruise industry.

2.2.1 Vessel Calls

Bookings for berths in Sydney Harbour tend to be made two years before the vessels arrive. Although there is a small and steady rate of cancellations, this arrangement gives the Port Authority a reliable projection of vessel visits for the next two years.

Calls by cruise ships increased by 13% in the 2016 year compared to the previous year. Bookings for 2017 were expected by the Port Authority to have increased by a further 9%, but actual bookings for 2017 showed an increase of 22% year-on-year to 369 (Figure 6).

The Port Authority projects longer term demand by forecasting total passenger growth by cruise operator, and determining the vessels calls required to accommodate that. Based on 2016 figures, it currently expects a significant slowdown in growth for the later years, declining from 2.7% to 1.9% per annum over the four years to 2021. The mean size of vessels visiting is expected to continue growing. The cruise industry expects demand to continue to grow over the same period at more than 10% per annum.

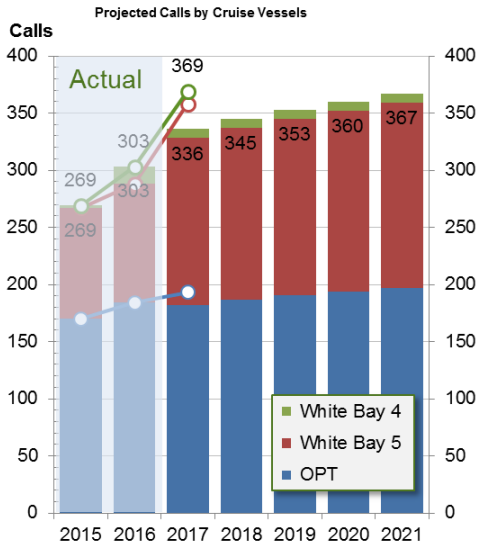

Figure 6 Projected Calls

2.2.2 Pilotage and Navigation

Although individual ships are provided with pilots for each trip through the Harbour for a trip that has approximately the same duration for any commercial vessel, and each ship uses navigation aids to much the same extent, the charge for both services is traditionally based on gross tonnage of the ship.

The projections of the number of calls that will be made by cruise ships is therefore accompanied by a projection of the type of vessel that will call, and hence its size. Based on 2016 calls, the Port Authority expects the average size (indicated by gross tonnage) of cruise vessels visiting the Harbour to increase over the years to 2021 by approximately 2.3% per annum (in addition to the increase in the number of visits expected). The combination therefore represents an expected increase in overall tonnage of about 4.6% per annum in the four years to 2021 (Figure 7).

The tonnage charge for vessels transiting through the Harbour is actually based on a range of sizes involving four bands as a proxy for the pilot skill required (Figure 1). In practice, however, 93% of all cruise ships are already in the highest band (which includes vessels greater than 55,000 gross tonnes), so the current band structure does not provide a great deal of value.

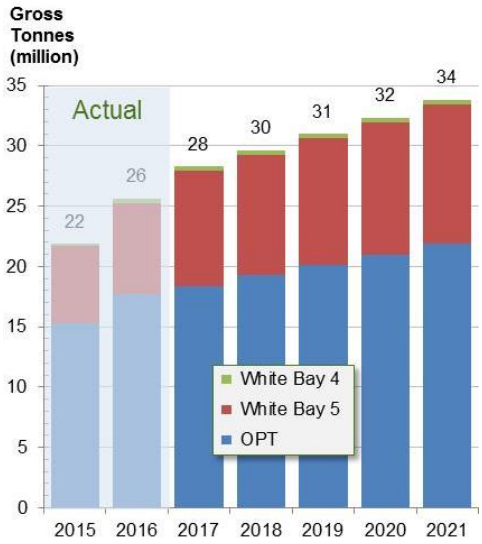

Figure 7 Projected Tonnage

2.2.3 Berthing

All cruise ships using the Harbour are now of a size where it is rarely possible to berth more than one at a time at any terminal (this was done once in 2015-16, with two small vessels). Current practice is to allow booking of berths in 24 hour 'slots', and to charge vessels occupying a berth for more than 24 hours for the use of two slots.

Demand for slots is expected to increase more or less in line with projections of vessel calls (Figure 8). Charges for berthing are currently based on the number of passengers on board, starting from a minimum of 1,200 passengers. Passenger numbers (units) per vessel are projected to increase at about 2.6% per annum to 2021, which gives a total projected increase of passenger units of about 6.5% per annum over the period (Figure 9).

Records from the 2015-16 year indicate that 3% of calls involved vessels with less than 1,200 passengers (Figure 2). Vessel utilisation (for home port vessels) averages 97% during the 2016 peak season (Figure 3), indicating that any further increase in demand by passengers will require either larger ships or additional vessels during peak season (which would need access to slots at a Terminal).

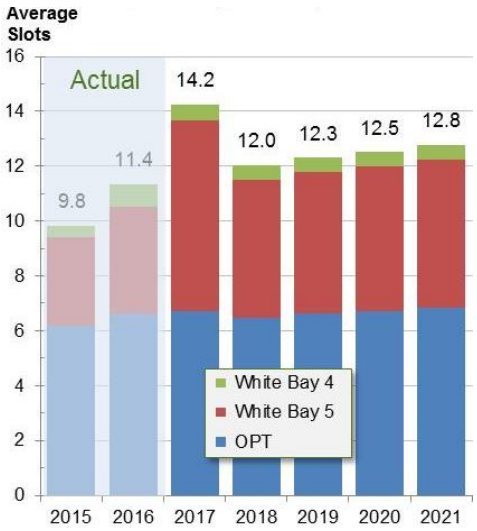

Figure 8 Projections of Slot Use

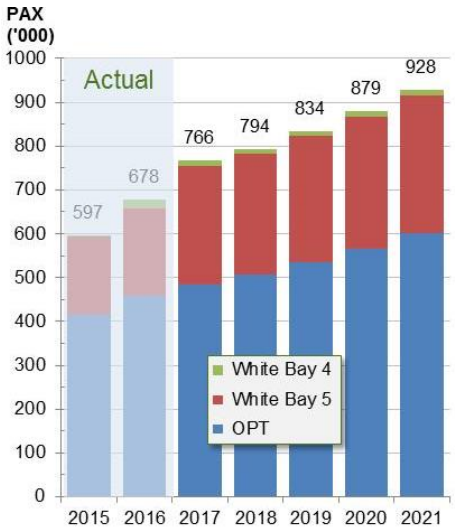

Figure 9 Projections of Passenger Units

There is in practice no resource constraint on the use of the Harbour itself, subject to passing distances and current curfews. There is, however, a maximum number of slots available at each Terminal as noted in Section 2.1 (based on the length of the slot available for booking).

Of the vessels that called during 2015-16, 58% berthed at the Overseas Passenger Terminal (primarily vessels not able to pass under the Harbour Bridge, but also including other vessels that were able to secure bookings during slots where the berth was not required by larger vessels).

Time of year projections made by the Port Authority (based on 2016 data) indicate that the Overseas Passenger Terminal, which had 3 unused slots during January and 4 during February 2016, is expected to have only 2 unused slots in February 2018 and only 1 unused slot in February 2021 (Figure 10). As noted above, these projections underestimated actual 2017 vessel calls.

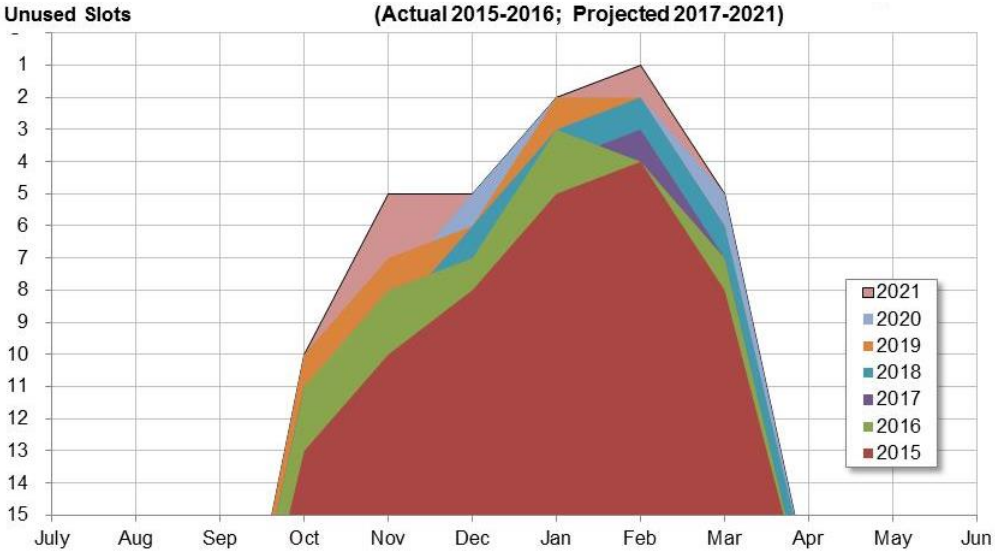

Figure 10 Unused Slots at the Overseas Passenger Terminal using the Port Authority's demand projections

The White Bay Cruise Terminal is not expected to have significant availability constraints during the next 5 years. Vessels able to pass under the Harbour Bridge can therefore be accommodated during this period.

2.2.4 Use of Harbour Buoys

Two buoys are used to temporarily berth vessels in the Middle Harbour: These are:

- Athol Buoy, which is located on the northern side of the harbour, just off Bradley's Head.
- Point Piper Buoy, which is almost directly opposite on the southern side of the harbour.

Vessels are only permitted to arrive on to the buoys during daylight hours, although they may depart at any time. All cruise vessels using the Athol Buoy also have to use their anchors due to the relatively low un-anchored displacement limits. All but the very smallest cruise vessels need to use their anchors at the Point Piper Buoy.

If the forecast indicates winds in excess of 25 knots, the 2 tugs and a pilot are also required whilst the vessel is on the buoys to ease the loads on the buoy and the mooring lines. In addition, as the Point Piper Buoy is located relatively close to the harbour channel, vessels longer than 200m are required to pay for two harbour removals to allow the vessel to be swung out of the channel to allow outbound vessel movements.

Athol Buoy was used 20 times during the 2015-16 year for a total of 251 hours, and Point Piper Buoy for 61.5 hours over the same period. Fees for the use of both buoys totalled approximately $19,600.

We have reviewed the costs of providing services at the buoys.

Revenues earned by use of the buoys in 2015-16 were very similar to the annual costs. The low and intermittent use of the buoys means that costs and revenues are not budgeted separately by the Port Authority. They are treated as 'navigation' assets, and revenues and costs are included with 'navigation'.

The costs and revenues associated with use of the buoys are not material, given the current low level of use of these facilities.

3.0 Asset Base

All of the services provided by the Port Authority to cruise ships involve the use of assets, and the building block methodology used by IPART provides for return of the capital involved through charges for the services.

The Port Authority has detailed records of its assets. Assessment of the value of these assets has involved:

- Review of the asset register and available documentation;
- Identification and inspection of significant assets through a site inspection;
- Quantification of those assets whose value is material to service delivery costs;
- Optimisation of those assets considered material to service delivery, by reviewing the extent to which the assets are required for optimal service delivery;
- Reviewing the book value of the assets as recorded by the Port Authority;
- Estimating the Replacement and Depreciated Optimised Replacement Cost (DORC) of material assets.

The Replacement Cost estimates represent:

> *'the likely tendered cost of recreating the asset using current day construction materials that will comply with current legislative requirements at 30-June-2016.'*

A Depreciated Replacement Cost is the current cost of replacement, depreciated over time (generally from the first date in service to the estimated end of life of the asset) using straight-line depreciation, and reflects the value of the remaining economic benefit of the asset.

DORC principles have been adopted for replacement cost of individual assets. Other costs that would be incurred to replace existing assets, such as costs incurred in securing planning and environmental approvals, design development and funding charges, have not been included. This valuation does not therefore present an all-inclusive DORC valuation of the Port Authorities cruise-related assets.

The Port Authority has assets used to provide Navigation and Pilotage services that are used for all commercial shipping using Sydney Harbour:

- Some of these assets are positioned in locations where they cannot provide a service for cruise shipping. These have been identified by establishing their positions on charts and confirming their role with the Port Authority. Where it has been confirmed that the assets are not usable by cruise shipping, they have been excluded from consideration.
- Some assets are used by all commercial shipping. In this case, the value assigned to services provided to cruise shipping has been allocated by relative number of vessels using the asset (cruise shipping is considered to employ these assets according to the ratio of calls by cruise ship to calls by all ships).
- The Overseas Passenger Terminal and the White Bay Cruise Terminal are dedicated to cruise shipping. White Bay Berth 4 is not, however, so the cost of that berth is allocated according to the relative number of cruise ships and commercial ships scheduled to use it in each financial year.
- The Port Authority has some assets that are used in support of all its services ('overhead assets'), and these have been included in this assessment. The value of these is assigned to each of the services in proportion to the asset value employed by each service. This results in a proportional increase in asset value of less than 1%. In our opinion this is a reasonable approach. We note that the increase in asset value to provide for overhead assets is not material.

3.1 The Asset Base

The assessed value of the asset base employed to deliver services to cruise shipping is considered in two forms:

- The Book Value of assets employed to deliver services to cruise shipping, which shows the value of the assets for each service, itemised by asset category as used by the Port Authority. The value of land used ('reclamations') has been taken from a report prepared for the Port Authority by KordaMentha which values the land according to its highest and best use. This has been provided in a confidential report to IPART.
- The value of the assets used by cruise shipping based on Replacement Cost is presented in Table 1.

These tables include total asset values derived from a detailed examination of all the relevant assets in the Port Authority's asset register. We have revised our estimated of DORC and provided detailed in a confidential report to IPART.

Table 1 Asset base using Depreciated Replacement Cost

Revised Book Value ($'000, FY2016)	End of FY2016		
Asset Category	WB 4&5	OPT	Total
Total Assets Employed	$419,589	$303,249	$722,839

The most significant variations to the value of the assets employed by the Port Authority include:

- Land value

  The Port Authority's current asset register includes land values provided by RHAS as at 30 June 2015. These were prepared on the basis of 'Value in use' (market value for existing use under current zoning classifications). The Port Authority obtained a valuation prepared during April 2016 by Korda Mentha that was developed on a 'Highest and Best Use' approach. We have accepted that valuation.

  The Overseas Passenger Terminal is used for non-cruise (restaurant) activity as well as cruise purposes. Since the revenues the Port Authority is able to secure from leasing premises to this non-cruise activity are not under review by IPART, we take the view that all costs that should fairly be allocated to non-cruise activity should be identified and excluded from consideration by IPART. The most reasonable method to separate building value between cruise and non-cruise activity appears to be by the proportion of space used. The non-cruise activity at the Overseas Passenger Terminal currently uses approximately 20.6% of the building area, so only 79.4% of all land value has been allocated to cruise shipping.

  There is a small shop in the White Bay Cruise Terminal, but since it is used exclusively for cruise-related services, the full cost of the terminal (including the shop) has been allocated to cruise shipping.

- Overseas Passenger Terminal buildings and plant

  It appears that these assets may have been over-stated, perhaps because the redevelopment cost has been capitalised to the building in addition to the existing asset value.

  We note that work-in-progress at this Terminal reached practical completion on 7 September 2016.

  It is good practice to 'Revalue' an asset when significant replacement or augmentation capital occurs before work in progress is capitalised in order to reassess replacement cost and remaining useful lives. We understand this has not yet occurred on the Overseas Passenger Terminal building.

  As noted above, non-cruise activity at the Overseas Passenger Terminal currently uses approximately 20.6% of the building area. Using the same argument as above, we have allocated only 79.4% of all building-related costs at the Terminal to cruise shipping.

- The remaining variations are related to nominated rates for depreciation and remaining useful lives

  The majority of assets are shown to have a purchase date of 2014 (July 2014 was the formation date of the Port Authority), and the assets have been depreciated from this point. We consider that a number of material assets have understated remaining lives, resulting in higher annual depreciation charges. We have adjusted these figures and the valuations accordingly.

  The caissons at White Bay and the Overseas Passenger Terminal, for example, are recorded with remaining useful lives of less than 7 years (and depreciation rates of 14-17%). We assess them as having remaining lives in excess of 15 years.

  Amending the remaining lives to reflect current expectations has a material impact by increasing the book value and reducing the annual depreciation charge.

- Current accumulated depreciation may be misleading

  Our assessment of current replacement cost is based on an optimised replacement cost, using current market costs applicable to the assets and their location. Depreciation prior to the Port Authority's formation in 2014 may not be included in the asset register, which results in an understatement of the replacement cost (which should be the sum of the current book value and accumulated depreciation). We have adjusted the asset data and valuations accordingly.

3.2 Benchmarking Against Similar Organisations

The replacement cost estimates for Port Authority assets have been built up from composite unit rates using current market rates. Sources used to estimate the unit rates include:

- Actual construction budgets for similar assets in Sydney;
- Recent tendered costs, interpolated to generate composite unit rates, indexed to current date;
- In house cost benchmarking material;
- Published indexation data (various sources);
- Professional opinion.

Current industry levels of profit, overheads, supervision and design and management fees that would be expected in replacing the assets have been allowed for in our valuations.

Whilst there are multiple construction methods, especially in regards to the marine structures, we have assumed the most economic methodology to generate replacement costs.

The building and plant components are generally similar to commercial buildings found in Sydney and the cost incurred to replace the assets would not differ from other market proponents.

Similarly, the marine infrastructure (wharves and jetties, sea walls and navigation aids) do not differ in terms of design or cost from other market proponents, and we expect that the Port Authority would incur very similar costs if replacing the assets.

3.3 Asset Optimisation

A valuation based on optimised replacement value requires that superfluous assets (those not needed for provision of the services) are excluded, but that all assets used are included in determining the asset base.

This section assesses the assets listed in the Port Authority's asset register to determine whether they are needed for cruise shipping purposes.

3.3.1 White Bay

The wharf structure at White Bay is not materially different to that at the Overseas Passenger Terminal. The structure was designed in the late 1960s for container trade. We consider that if the structure had been designed for present day cruise ships, it would not have a materially different design. Assuming that the ground conditions would present competent strata at relatively shallow depths, a gravity structure such as caissons is an appropriate solution for use by cruise ships.

The largest vessel that currently calls at White Bay is *The Noordam*, which with a 285mLOA (length overall) extends beyond the current wharf limits (260m) when at berth. The wharf is not therefore too long for the likely cruise vessel fleet. The continuous quay line at White Bay berths 4 and 5 is a legacy of its former use as a container wharf. It would be possible to deliver a similar level of service to cruise shipping with a shorter wharf at Berth 5, supplemented by berthing and/or breasting dolphins. Given that Berth 4 remains a common user berth and not exclusively a layby berth for cruise ships, Berth 4 would need to retain a continuous quay line to handle a variety of cargos. In that context, it is reasonable to retain the construction of Berth 5 in a similar form.

The pavement behind Berth 5 is relatively heavy duty, having been originally designed as a container yard. There is scope to optimise this pavement to lighter duty, more appropriate for its current level of service.

There are two buildings on site (the Office / Amenities Buildings at White Bay) which are currently allocated to Cruise but do not appear to actually contribute to cruise ship operations. We have excluded these assets from the optimised asset base allocated to cruise shipping.

Assets funded by the Barangaroo Delivery Authority are used to deliver services to cruise ships, and are therefore included for valuation purposes based on DORC (depreciated optimised replacement cost) principles.

3.3.2 Overseas Passenger Terminal

The Overseas Passenger Terminal was constructed as a purpose built facility in 1958. The wharf is constructed from nominal 30ft diameter reinforced concrete caissons founded on a rock base course which overlays the natural bed.

We have not reviewed geotechnical data, but would expect to find competent founding strata (such as sandstone) at relatively shallow depths at this location. On this basis, a gravity structure such as caissons would be an appropriate form of construction. This berth was designed for cruise vessels and has not been subject to change of use. It would therefore be reasonable to assume that the structure is not overdesigned.

The length of the berth structure at the Overseas Passenger Terminal is about 220m. Recent and ongoing augmentation works by the Port Authority to add a further mooring bollard at the southern end of the berth, and the 2 drag anchors and subsequent mooring dolphin in Campbells Cove at the northern end of the wharf, are required to accommodate the increasing length of cruise vessels visiting the berth.

It would be possible to accommodate cruise vessels with a shorter wharf length, supplemented by additional breasting and/or mooring dolphins. A configuration similar to this is used at other Australian cruise terminals. This would likely be a lower cost solution but is not considered appropriate at the Overseas Passenger Terminal as it would reduce the paved foreshore area, significantly detract from the public amenity at the location and require a significant change to reprovisioning activities that could increase the time needed for vessel turnaround.

3.3.3 The Channel

The Channel is owned by RMS, not the Port Authority, and RMS charges a fee for its use. It is largely a natural asset, but there has been dredging particularly in the eastern and western approach channels, where current dredged depths are around -14mCD.

Most of the cruise ships that use the Sydney terminals only require a declared channel depth of around -10mCD (including the under keel clearance as required by the Harbour Masters Guidelines).

The channel is deeper in some areas than required for cruise vessels. From a DORC point of view it would be expected that cruise ships are allocated the optimised channel replacement cost (ORC) rather than the replacement cost of the channel.

3.4 Planned Renewal and Augmentation Works

We have reviewed the Port Authority capital expenditure budget for projects planned during the 2017 to 2021 period.

In relation to the planned capital works:

- Capital expenditure that benefits all Port Authority customers has been allocated to cruise according to its share of all vessel calls (except for projects at the Terminals, where the cost is allocated 100% to cruise shipping).
- The projects described as ‘Navigation’ are dominated by development of the Fire Fighting Capability Platform. The Port Authority’s Port Services Operating License (PSOL) requires that sufficient equipment and skilled personnel by provided to enable a response to port emergencies within 30 minutes of notification. We understand Fire & Rescue NSW have advised that the current firefighting vessels owned and operated by the Authority are too slow, lack manoeuvrability and do not have the ability to get to shallow areas needed to enable the Authority to comply with the requirements of Fire and Rescue NSW.[2] The current vessels are adapted aged tugs which are likely to experience escalating annual maintenance costs.

  The Port Authority has provided for replacement of the existing Firefighting Tugs with firefighting vessels designed to meet current standards and enable the Authority to meets its obligations under the PSOL. The number and details of proposed replacement vessels have not been provided. We do not have sufficient details to verify the replacement cost, but the allowance provided appears reasonable.
- Additional expenditure planned for the Vessel Traffic Management System is also understood to be required to enable the Authority to comply with the requirements of its PSOL. An annual allowance has been provided for refurbishment or replacement of navaids.
- The Port Authority completed a substantial upgrade of the Overseas Passenger Terminal in 2016 to enable it to cater for the increased number of passengers carried on the larger international cruise ships (an increase in capacity from about 2,500 to 5,000 passengers). Final payments for this development fall due in 2016/17.

[2] S00069

- The connection-reliant gangways at the Southern end of the Overseas Passenger Terminal have reached the end of their useful lives. Based on the Project Expenditure Request Form, the budget to replace these appears reasonable.
- A number of other augmentation works are currently planned to improve access or services provided at the Overseas Passenger Terminal. Although detailed business cases for these were not available, the scale of these investments is not large, and based on our review of the documentation provided we consider the basis for these planned investments to be reasonable, and the project costs appear reasonable for the level of detail, scope and complexities of the projects as presented.

Our review of the asset register identified a number of assets that are scheduled to reach end of life before 2021 for which we have not been able to identify an associated renewal project. The Port Authority does not expect to replace these in the next five years, implying that it expects a longer remaining life than currently indicated.

3.5 A Second Terminal east of the Harbour Bridge

There appears to be no provision for a new cruise terminal east of the Harbour Bridge. It seems clear that, based on the Port Authority's projections of demand, a second terminal would be required no later than 2022 to avoid refusing access to cruise ships. If demand growth continues at recent rates (as projected by the industry itself), a second terminal could be required as early as 2018.

Based on the recent terminal development at Newcastle, a second terminal east of the Harbour Bridge could take 18 – 24 months develop, but at least 2 years to gain the approvals required (assuming that agreement can be reached on a suitable site). As a rule of thumb, the terminal could cost around $100 million, and would be expected to have an economic life or around 50 years.

Return of this capital investment would therefore require approximately $2 million to be recovered from users (cruise ships) per annum in current dollars, presumably through charges. Adding return of the investment for a new Terminal, if funded from charges, would require cost recovery to increase by 8%.

3.6 Demand Management

We have noted that the Port Authority has projected that demand will increase on average after 2017 by 2.2% per annum, whereas actual bookings for 2017 were 10% up on Port Authority projections (Figure 11). The cruise industry itself has projected between 4.5% (CPTSC LOW) and 11.5% (CPTSC HIGH), implying that by 2021 call numbers could be as much as 75% greater than the Port Authority's projections. . Some operators anticipate demand increasing at even higher rates (around 15% per annum).

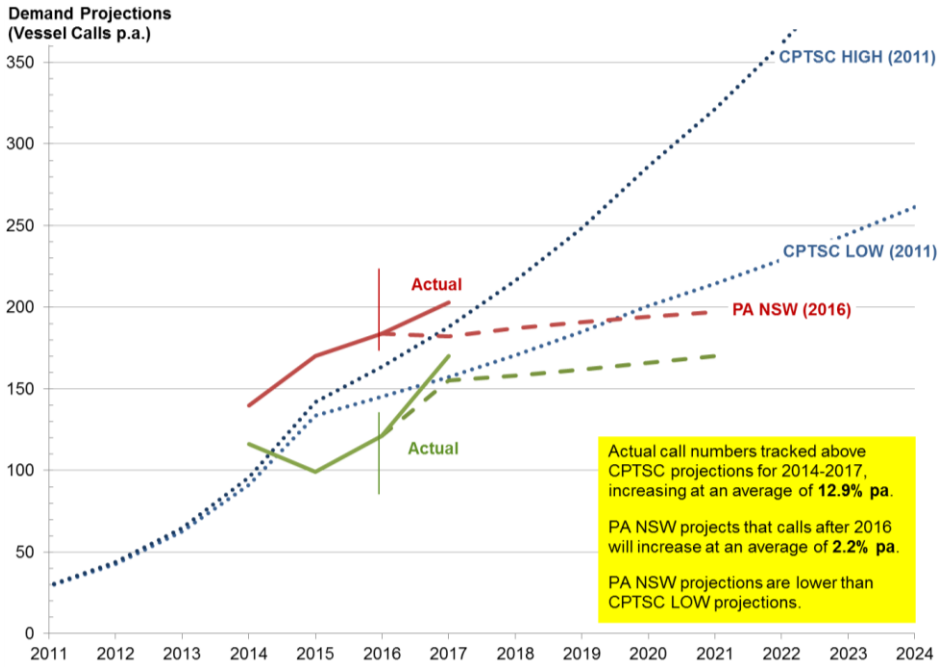

Figure 11 Demand Projections

In practice, cruise operators prefer specific days of the week, and international operators have limited flexibility in terms of the timing of their calls to Sydney, so the Terminal is likely to be considered fully utilised now for the slots in greatest demand.

The impact of higher demand projections is significant, especially in relation to the Oversea Passenger Terminal. When actual bookings for 2017 are factored into the Port Authority's demand projections, the Overseas Passenger Terminal will have only one 24-hour slot available in February 2019. If demand increases at a higher rate, slot availability constraints occur sooner and be more significant.

The constraint on the use of the Overseas Passenger Terminal is expected to force operators to use larger vessels to accommodate demand, which will enable an increasing number of passengers to use the Terminal, but is likely to increase the proportion of vessels that are unable to pass under the Harbour Bridge, and therefore can only be berthed at the Overseas Passenger Terminal.

The impact of alternative demand growth scenarios has been modelled, extrapolating using the 2017 booking data and call patterns using higher rates of demand growth, and two examples are presented in Figure 12. If in these two examples:

- Growth averages 5% per annum (left chart), there is likely to be un-satisfied demand for slots at the Overseas Passenger Terminal for two months (January and February) in 2021 (shown as a faded area at the top of the left chart).
- Growth averages 10% per annum, there is likely to be un-satisfied demand for slots at the OPT from 2018-19 (right chart), extending to the whole October-March season of 2020-21.

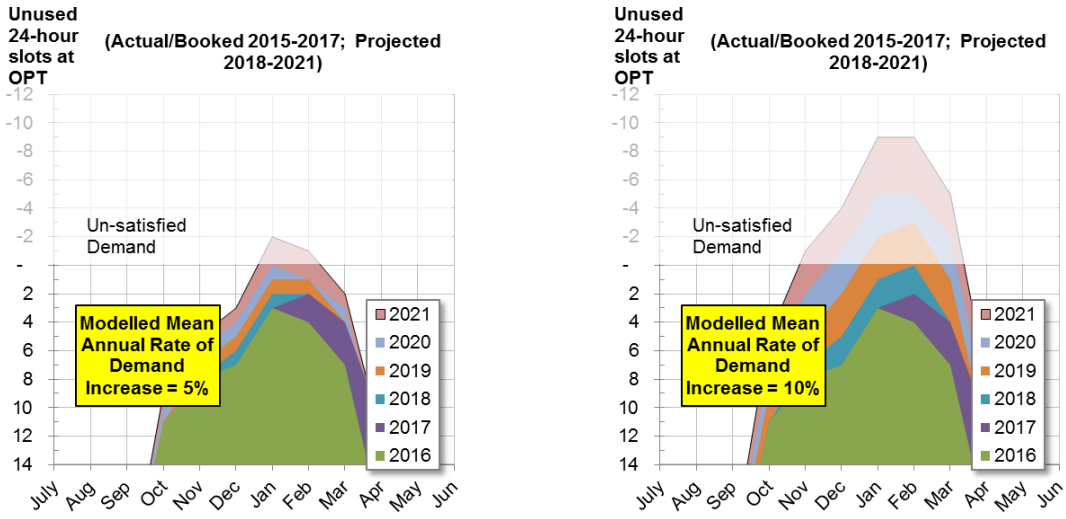

Figure 12 Unused 24-hour slots at the Overseas Passenger Terminal under alternative demand growth scenarios

When the OPT is fully utilised, ships able to pass under the Harbour Bridge will have to use White Bay. The impact of increasing demand at White Bay will eventually require all the capacity there as well (during peak season).

Modelling suggests that if demand growth is 7.0% per annum on average, the OPT will be at full capacity between December 2020 and March 2021 (the left chart in Figure 13), and as a result WB5 will be fully utilised in January 2021 (the right chart in Figure 13) assuming that vessels unable to use the OPT are able to sail under the Harbour Bridge.

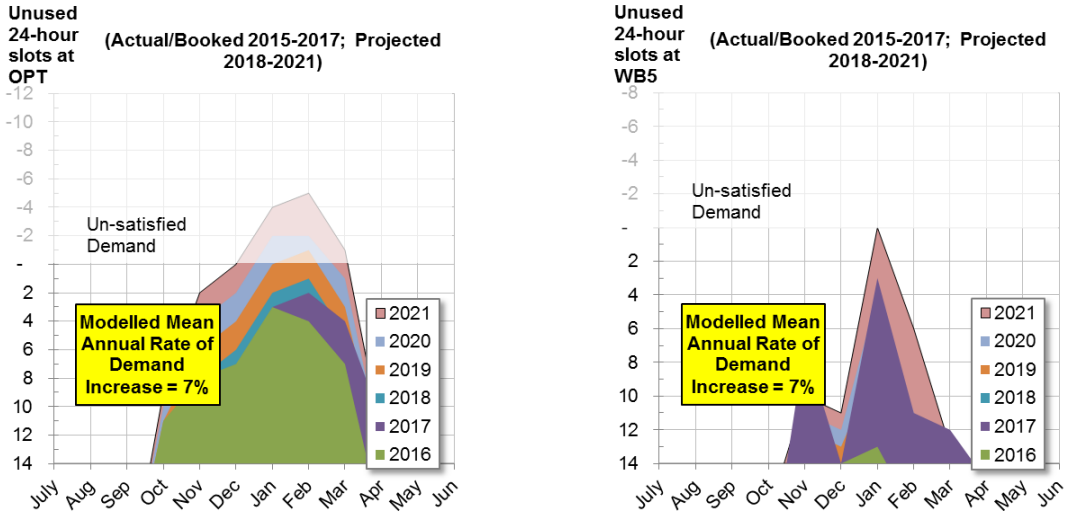

Figure 13 Unused 24-hour slots at both OPT and WBCT

Higher actual increases in demand will have a greater impact than indicated. The implication is that it is quite likely that both terminals could be fully utilised during the peak season by 2021, and if the CTSP's high growth projection were to eventuate, full utilisation of WB4 during peak season could occur a year earlier (in January 2020). Fortunately WB4 is also available for use if required.

3.7 Slot Management

There are no plans currently in progress to provide alternative berths east of the Harbour Bridge, and some reports suggest that there are in fact no alternative locations available (Garden Island may be available in an emergency, but it appears that access to the berth cannot be relied on).

In the absence of any current strategy to address the problem, it appears that an increasing number of cruise operators will be forced to exclude Sydney from their tours (and we understand that some are already using Melbourne instead of Sydney because of these constraints).

We understand that it takes approximately an hour for a vessel to travel from Fort Dennison, where two vessels are able to pass, to or from the berth at the Overseas Passenger Terminal. If two movements in 24 hours could be considered, this implies a maximum time alongside of about 10 hours.

Data provided by the Port Authority indicates that 16% of vessels occupied the berth for 10 hours or less during 2016, suggesting that use of a 12-hour slot management system might be viable and would increase the capacity of the berth.

Using the Port Authority's data, it is possible to project berth utilisation if those vessels able to turnaround in 10 hours or less can be managed to enable two calls to be made in a 24 hour period, assuming that all other vessels continue to require 24-hours at the berth (and therefore take two or more 12-hour slots).

The projected use of the Terminal under a 12-hour slot management system is presented in Figure 14, using the same presentation format as the 24-hour slot usage shown in Figure 12. It should be noted that the slot numbers in this case are 12-hour slots, and should be divided by 2 when comparing to the previous charts.

Figure 14 indicates that, under a 12-hour slot management system and assuming demand growth of 5% per annum (left chart), there would be no slot requests refused through to 2021 with spare capacity in all months other than February. In comparison, under the current 24-hour slot management system, there would be two 24-hour periods in February 2021 when slot requests would be refused (left chart in Figure 12), but there also be no spare capacity in January.

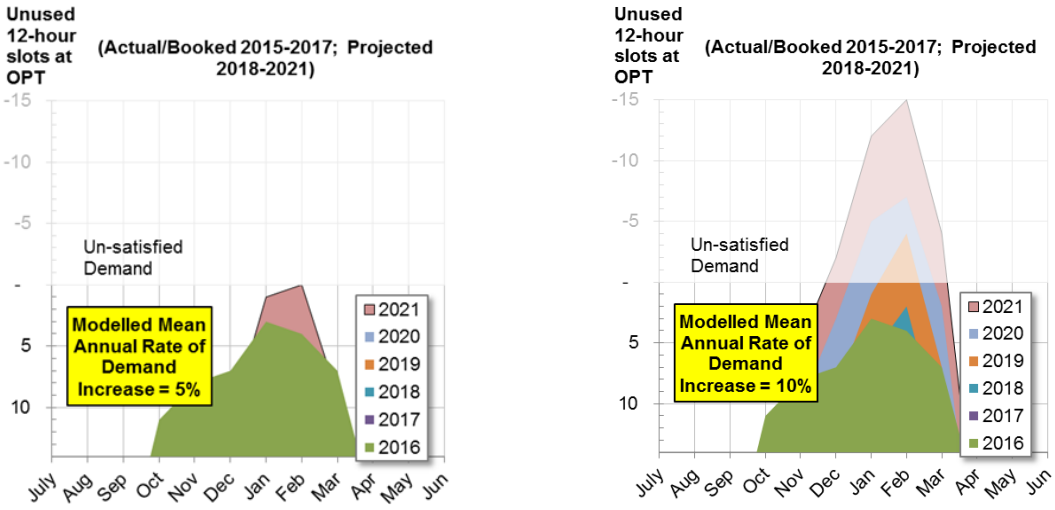

Figure 14 Unused 12-hour slots at the Overseas Passenger Terminal under alternative demand growth scenarios

3.8 The Potential for Efficiency Savings

Organisations may be compared using an *Asset Consumption Ratio* (which highlights the aged condition of an entity's stock of physical assets) or an *Asset Sustainability Ratio* (which approximates the extent to which assets are being replaced as they reach the end of their useful lives, measuring capital expenditure on renewal or replacement of assets relative to the depreciation expense).

An asset base is noted as 'improving' if the ratio is between 60% and 75%. The minimum required standard is 50% or greater. The Port Authority has an *Asset Consumption Ratio* of about 62%, which is satisfactory. The standard is met if the *Asset Sustainability Ratio* can be measured and is 90%, and is considered improving if the ratio is between 90% and 110%. The Port Authority's Asset Sustainability Ratio is approximately 90%.

It appears from our review of documentation provided by the Port Authority that its processes to deliver capital works comply with current good practice, and there is likely to be little room to improve delivery performance. The level of capital expenditure seems appropriate when compared to organisations in Sydney with similar assets.

4.0 Operating Costs

This section reviews the main components of operating costs as allocated to cruise shipping.

4.1 The Operating Expenditure Structure

The Port Authority has projected an annual budget of approximately $25 million for 2016/17 for cruise shipping. The Port Authority's allocation of operating costs involves:

- Developing an operational budget for expenditures directly related to each of the services, including staff costs and depreciation of assets employed.
- Allocating shared costs to each service, using tonnage (for navigation and pilotage), passenger numbers (for site occupancy) and cost pass-through for the channel fee and most miscellaneous charge types.
- Allocating a proportion of the overhead costs incurred by the Port Authority, generally done on the basis of relative headcount or relative size of total direct budget.

An indication of the components of the operating expenditure as allocated to cruise shipping is presented in Figure 15. Approximately 29% of the cost relates to the Overseas Passenger Terminal, and depreciation is about 22% of all costs. About 22% of all operating expenditure represents external costs (the channel fee, and recoverable security and cleaning costs) that are passed through to cruise customers.

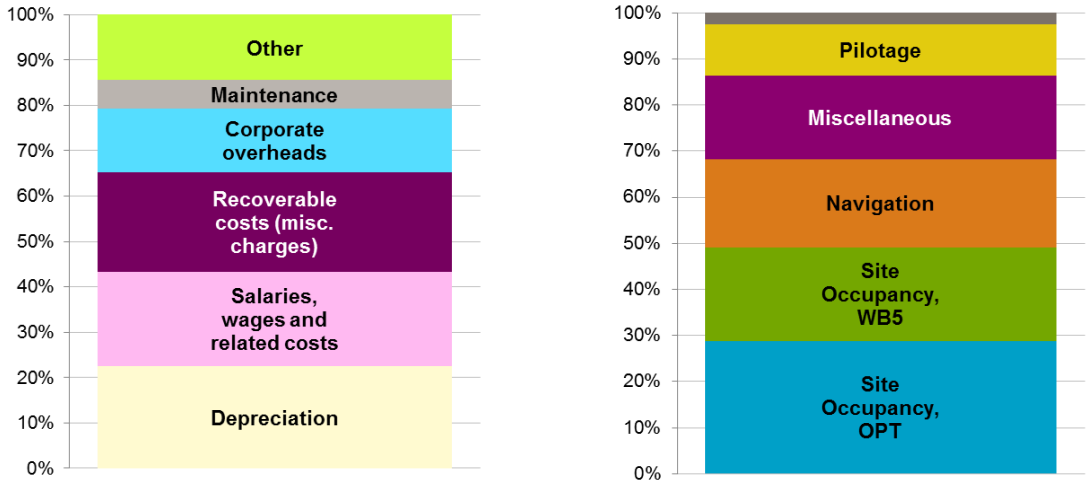

Figure 15 The components of FY2016 operating expenditure used to provide services to cruise shipping

All of these costs are recovered via charges from the cruise operators.

4.2 Operating Expenditure

The operating costs allocated to each service are presented in Table 2, which shows the main cost categories used by the Port Authority and the cost as allocated to each service.

In relation to Table 2:

- The Port Authority's asset base was reviewed in the previous section. Depreciation has been calculated for this asset base and is included in this section as an operating expenditure.
- The majority of security and cleaning costs are passed through to the cruise operators, and are shown as miscellaneous charges. The small proportion not recovered directly from cruise ships is treated as a 'residual' cost recovered via the site occupancy charge at each Terminal. These services are sourced via competitive tendering and therefore reflect market prices. We do not see opportunities to reduce these costs without affecting the quality of the service obtained.
- The channel fee is an external cost imposed on the Port Authority, included in navigation charges.

Table 2 Cruise-related Operating Expenditure

OPEX ($'000, FY2016)	End of FY2016		
OPEX Category	WB 4&5	OPT	Total
Total OPEX before Depreciation	$3,229	$4,766	$7,995

Note: Depreciation is derived separately by IPART

4.2.1 Maintenance

We have reviewed the maintenance budget (excluding cleaning) for 2015/16. Using benchmarked maintenance allocations by asset type and replacement cost, we believe the maintenance budget is reasonable.

We note that since its formation the Port Authority has achieved annual cost reductions by fine-tuning maintenance agreements and rationalising maintenance activity. We therefore accept the current level of expenditure for maintenance as reasonable.

4.2.2 Operating Cost Reduction

The Port Authority established a significant cost reduction program soon after its establishment. This program has resulted in savings in controllable costs of more than 22% with measures such as:

- Restructuring and subsequent attrition of staff;
- Termination of some services, including maritime security identification card (MSIC) administration;
- Termination of some office leases and subsidies previously paid by the Port Authority;
- Re-negotiation of lease and service agreements and a range of other cost reduction programs.

Restructuring and attrition has resulted in a further staff cost savings. Various efficiency improvement actions are still in progress. While we have not had an opportunity to review staff performance, we believe that any further opportunities to improve cost efficiency are likely to be minor, and not material to cruise charges.

We noted during discussion with the Port Authority that a rather complex billing system is in use, which results in the production of several invoices per call, produced within a day or two of each other. The complexity of the system is partly a result of an overly complex charging structure, but we believe there is room to improve in this area. The efficiency gains are likely to be small, however.

4.2.3 Channel Fees

The Ports and Maritime Administration Act 1995 established the Port Corporations, and allowed the Minister to transfer port safety functions to the Port Corporations via an Operating Licence. The freehold title of the channel bed (including berth boxes) was retained by the State represented by the Marine Ministerial Holding Commission (MHHC), now Roads and Maritime NSW (RMS). The Act refers to a Port Operating License but makes no reference to a channel usage charge.

The concept of a channel fee appears to originate from the work completed by Ferrier in March 1997, which recommended that a Channel Fee be established to recognise that entities (the Ports Corporations) are earning revenue from assets owned by MHHC. Channel Fee Agreements were signed with Port of Newcastle Corporation, Sydney Port Corporation and Port Kembla Port Corporation during 1998 and 1999, and revised channel fees were approved by the Minister for implementation from 1 July 1999.

The Channel User Licence Agreement for Sydney Harbour has not been made available for review. It is anticipated to be based on similar principles to the Channel User License Agreement for Port Botany, which:

- authorises the Ports Corporation to use the Channels and Berthing Boxes to carry out its functions, including the right to use the channels and berth boxes for commercial gain, and to undertake maintenance dredging and repairs to navaids as required;
- confirms RMS as the registered proprietor of maritime land;
- states that it is not a lease agreement and does not give the Corporations any proprietary interest in the assets.
- states that the Channel Fee is 13.8% of the Navigation Service Charge (but does not provide the basis for the fee amount);

- restricts RMS from making changes to the assets or activity that could affect the safety of port operations, requires RMS to permit reasonable dredging that the Corporations may wish to undertake, but retains for RMS the right to restrict access to the channels for safety/security reasons and for major events.

It would be reasonable for the Channel Fee to be based on the depreciated replacement cost of improvements carried out to the harbour to enable current service levels (starting from the channel as it was at the time of European First Settlement). Since the channel depths are maintained, it would be assumed that the channels have infinite services lives and therefore the asset does not depreciate.

A channel valuation was completed for NSW Maritime in 2011. We note that we would consider this valuation to be under-stated:

- The valuation report refers to published articles to confirm dredging rates. This is not a robust approach because:
    - The soil type, stiffness and disposal strategy at each site determine the dredging plant and construction duration. These factors drive cost. No assessment of ground conditions at the site was made.
    - No assessment was made of appropriate disposal locations and whether disposal was offshore or into reclamation for each example given. Disposal strategies (and therefore costs) are likely to be quite different at all the comparisons given.
    - Most of the projects presented relate to a significantly larger dredged volume than the 5.6Mm^3 considered in Sydney Harbour. The mobilisation of dredging plant is a substantial cost, which is diluted as dredged volume increases, leading to lower overall rates with larger dredging projects.
- The rate selected for dredging costs is toward the lower end of the projects sampled and does not correlate with those presented for Australian projects.
- The rate selection assumed that all of NSW Maritime assets across all 4 locations would be dredged as a single contract, thereby securing a lower rate. This may not appropriate in this case as this study relates to the Port Jackson channels and berth pockets in isolation.
- In addition, no allowance has been made for the present day costs that would be incurred in securing the required planning and environmental approvals. This could be costly and time consuming.
- No allowance has been made for finance and funding costs that would be incurred for a project of this size.

An appropriate channel valuation should be based on a dredging strategy using on relevant geotechnical data. In the absence of that, dredging could cost 2 to 3 times that used in the NSW Maritime valuation, noting that it is likely to be in sandstones and rock, not soft materials. In addition we would expect upfront planning costs to be significant; perhaps in the order of $100M for a project of this scale at this location.

Based on the dredged volumes developed by NSW Maritime, we would anticipate the Sydney Harbour Channels to be valued in the order of $250 to 450 million. While it can be assumed that the channel assets do not depreciate, recovering the capital cost over a nominal life of say 100 years would indicate an annual recovery in the order of $2.5 - $4.5 million. This compares to the $5.4 million projected by the Authority in 2016, rising to $8.7 million in 2021.

It should also be noted that not all the channel areas are required or used by cruise vessels. Based on the descriptors and volumes used by NSW Maritime, we estimate that only 88% of the channel valuation applies to channel assets used by cruise ships. In addition, cruise vessels do not use the full water depth that is reflected in this channel valuation. The Western Channel, for example, has been deepened to in excess of -14mCD in some areas, but this depth is not required by the cruise vessels that currently call at Sydney.

We estimate that only about 60% of the total dredged volume is required or used by cruise ships. This suggests that a reasonable channel fee (before allocation to cruise) would be in between $1.5 to $2.2 million per annum.

We therefore conclude that, from a cost-reflective point of view, the current channel fee charged to cruise shipping appears excessive.

4.3 Benchmarking of Operating Costs

It is difficult to compare costs between ports because of the often very different configurations. Comparisons with ports in other countries is difficult because the extent of any state subsidy cannot be established, and labour cost rates can be very different. One area that can be assessed, from a supply perspective, is pilotage.

Benchmarking of the level of resources allocated to the pilotage service provided is problematic because:

- The total number of pilots and service hours provided at comparison ports is unknown
- The total number of vessel calls and pilotage time at other ports is not known
- Some ports have multiple pilot boarding grounds and destinations. The proportion of each is unknown.
- The pilotage time is known only as a typical approximate duration
- Pilot vessels can support more than one pilot, making benchmarking of pilot vessels impractical.

As an alternative, benchmarking of the pilotage charges across a range of Australian ports has been completed. International ports have not been considered to avoid the distortion that would likely result through a comparison across economies and varying local costs.

The pilotage charges used for the Port Authority are those effective from 1 January 2016. It is therefore assumed that they include the proposed tariff increases referenced in the Port Authority's Revised Business Plan.[3]

The selected ports for benchmarking are presented in Table 3 and presented in Figure 16. Charges are plotted against vessel GRT as this is current charging basis for the Port Authority of New South Wales.

Table 3 Pilotage Charge Benchmarking

Port	Basis of Selection	Comments
Port of Portland, Victoria	Port with comparable typical pilotage time.	- Portland experiences a similar number of annual vessel calls to Sydney Harbour - The average pilot transfer time is 1.5hrs. This compares well to the 1.5-2hrs for Sydney Harbour. - Portland is serviced by 2 pilot vessels.
Port of Melbourne	Port with a significantly longer Pilotage time	– Pilot transfer times for the boarding ground to the port area are in the order of 3-4hours. – As the Pilot transfer time is significantly longer than at Sydney Port, it would be reasonable to expect a higher pilotage charge at the Port of Melbourne.
Flinders Ports: Klein Point, Port Adelaide, Port Giles, Port Lincoln, Port Pirie, Port Thevenard, Wallaroo	Small ports with a pilotage charge independent of GRT	- Pilotage is a fixed price across all 7 ports. - Pilotage charge is the same for all vessels - The total vessel calls across all ports is comparable to Sydney Port

[3] S00070

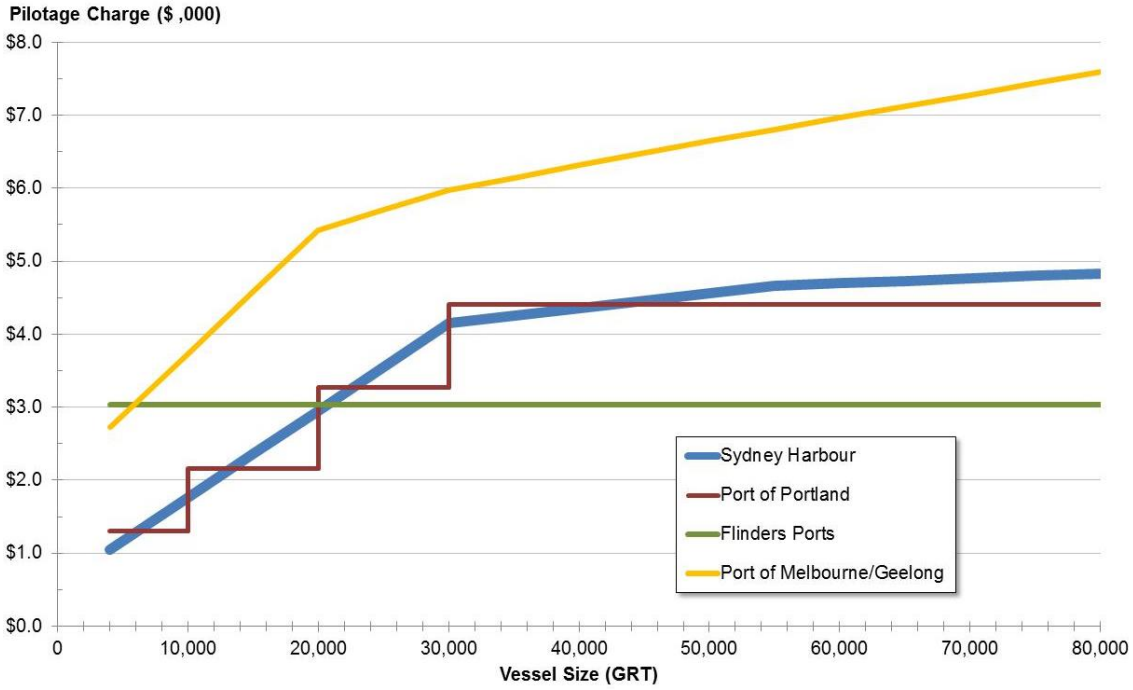

Figure 16 Pilotage Charge Benchmarking

We draw the following conclusions:

- The pilotage charge at Sydney Harbour is lower than at the Port of Melbourne as would be expected. This reflects the much longer typical pilotage time at the Port of Melbourne.
- The pilotage charge at Sydney Harbour compares well with the charges at the Port of Portland. This reflects the comparable pilotage time at the Port of Portland and Sydney Harbour
- The fixed pilotage charge at Flinders Ports results in higher charges for smaller vessels than Sydney Harbour, and lower charges for larger vessels, as expected.

This benchmarking indicates that the pilotage charges at the Port of Sydney are broadly in line with the charges at the selected other Australian Ports.

4.4 The Potential for Efficiency Gains

4.4.1 Pilotage

Pilotage services are currently offered by the Port Authority, which employs 42 FTEs in this area for Sydney Harbour of which 22 are Marine Pilots. These pilots serve vessels arriving in Sydney Harbour, as well as vessels arriving in Port Botany and Kurnell. There are economies of scale through this provision of a single service that benefit all users of pilotage services.

Pilotage can be a candidate for privatisation, and privatisation has been successful in other jurisdictions. Several Australian ports procured pilotage services from a private operator, including:

- Port of Melbourne, Victoria (Port Phillip Pilots);
- Port of Brisbane, Queensland (Brisbane Marine Pilots);
- Port of Darwin, Northern Territory (as part of the recent port lease);
- Port Hedland, Western Australia;
- Port of Portland, Victoria (as part of the private entity operating the port);
- Flinders Ports, South Australia.

Many of these organisations gain similar economies of scale through providing pilots services at several ports.

Pilotage services in Sydney were privatised in the early 1990s but were later brought back into the Port Authority due to concerns over maintenance of the assets and the level of service being delivered.

The reasons for the lack of success of the privatised pilotage in Sydney are unclear, particular given the precedent for successful privately operated pilotage services elsewhere in Australia. The potential impact on cruise shipping is moot, given that the benchmarking exercise presented in Section 4.3 indicates that the pilotage charges are comparable to those charged by a privately operated service at a similar port.

4.4.2 Turnaround Time

We have noted that, if turnaround time could be reduced below 11 hours (a half day, less movement time) there would be opportunities to schedule ships using a 12 hour management system, and this could substantially increase berth capacity in the short to medium term.

There is evidence that it takes longer for vessels to turnaround in Sydney than in their winter home ports, which suggests that it may be possible to re-configure or provide operational service improvements at the Overseas Passenger Terminal to reduce turnaround times for home port vessels. We recommend that this opportunity be investigated.

5.0 Cost Recovery through Charges

The previous sections reviewed the Port Authority's cost base in order to reach a view as to whether they are efficient and reasonable. This section reviews the methodology used by the Port Authority to allocate charges, to assess whether the charging structure is cost-reflective and whether cross-subsidy is implied between services or customer groups.

5.1 The Current Charging Structure

The current charging structure is documented in the Port Authority's Schedule of Port Charges for Sydney, effective from 1 January 2016. In summary, the Schedule provides for:

- Navigation Services charge per gross tonne per port entry. This charge includes recovery of a channel fee imposed by RMS for use of the Harbour, which is based on revenue earned from the vessel;
- Pilotage charges based on four tiers of vessel tonnage, including a fixed boarding fee;
- Site Occupation charges based on the number of passengers on the vessel's manifest, charged per 24-hour slot used, with a minimum charge equivalent to 1,200 passengers;
- Several miscellaneous charges such as security and cleaning services provided at the Terminals, use of non-passenger berths and moorings.

The current pricing structure was originally introduced by the Sydney Ports Corporation in 2012/13. This included notice of an intention to increase site occupation charges in the 2016/17 year, and thereafter to link these charges to the consumer price index.

5.2 Recovery of Navigation Costs

This review has concluded that the Port Authority has an almost completely fixed annual cost structure for delivery of navigation charges, aside from the RMS channel fee which is in practice treated as a fixed cost in the charging structure. A proportion of these costs escalates annually and will therefore require an annual increase in charges.

We note that:

- The methodology currently used (charging by vessel tonnage) represents a continuation of historical precedent apparently based on capacity to pay, and is in common use in the industry.
- The cost of providing Navigation services is in practice independent of vessel size or even vessel numbers (when considering commercial shipping), and is therefore a fixed cost – there are no navigation costs that change in relation to vessel size or revenue earned from the vessel.
- There appears to be no logical basis for the size of the channel fee imposed by RMS or the methodology used by RMS in applying the fee. Any remedial or maintenance dredging required in the harbour is the responsibility of the Port Authority and would have to be recovered from its customers, so there is no annual cost involved in maintaining the Harbour. There are no plans for dredging in the area used by commercial shipping, and it has been several decades since dredging was last carried out. The improvements made to the natural Harbour are likely to have been fully depreciated by now, and the asset is not expected to deteriorate over time, so there is no basis for a depreciation charge. Finally, the link between revenue earned from the vessel and use of the channel is difficult to prove.

In the absence of a demonstrable link between the cost of the service and vessel size, we conclude that the current approach penalises larger vessels, and represents a cross-subsidy from them to smaller commercial users of the Harbour.

The cost of navigation services must be recovered from vessels using the Harbour. We conclude that the most reasonable approach would be an allocation by expected vessel numbers, and therefore be a fixed fee per commercial vessel (irrespective of size).

5.3 Recovery of Pilotage Costs

This review has concluded that the Port Authority also has an almost completely fixed annual cost structure for delivery of pilotage services. These costs escalate annually and will therefore require an annual increase in charges.

We note that:

- The methodology currently used (charging by vessel tonnage in four tiers) represents a continuation of historical precedent, and is in common use in the industry.
- A boarding fee (for the pilot) is currently applied to all vessels, and is currently a fixed charge.
- The cost of pilotage is effectively independent of vessel size (when considering commercial vessels). All commercial vessels are speed restricted in the Harbour, so the pilot tends to be on board for approximately the same length of time for any vessel. The cost of the service is dominated by cutter-related costs, and the cost of having a pilot on board for approximately an hour and a half during each transit of the Harbour is a small proportion of total pilotage costs. Although large vessels are considered to require more qualified pilots, in practice pilots are trained for all vessel sizes and rostered to vessels without consideration of size.

A size-based charge could be considered necessary because larger vessels represent a greater liability if an incident occurs. We note, however, that any liability is more likely to be related to the nature of the cargo, and the ship operator carries insurance to cover incidents. The pilot is not able to be held liable for any incident. Risk does not therefore seem a viable or defensible basis for supporting a size-based charge. In the absence of a demonstrable link between the cost of the service and vessel size, we conclude that the current approach penalises larger vessels, and represents a cross-subsidy from them to smaller commercial users of the Harbour.

The cost of pilotage services must be recovered from vessels using the Harbour. We conclude that the most reasonable approach would be an allocation by expected vessel numbers, and therefore be a fixed fee per commercial vessel (irrespective of size).

5.4 Recovery of Site Occupancy Costs

Security and cleaning services are passed through to customers by the Port Authority as miscellaneous charges, and do not form part of the site occupancy charge. Residual security and cleaning costs (not recovered via miscellaneous charges) have been included in site occupancy costs.

This review has concluded that the Port Authority also has an almost completely fixed annual cost structure (in 2015/16 terms) for site occupancy services. These costs escalate annually, and will therefore require an annual increase in charges.

We note that:

- We have been unable to identify any material cost elements that vary according to the number of passengers on board a vessel.
- The Overseas Passenger Terminal has been expanded to cater for larger passenger numbers carried on larger vessels, so it could be argued that the (fixed) capital cost incurred should not be recovered from vessels that did not need the expansion.
- The size of the vessel has no impact on the cost of services provided at the berth. It is possible to berth more than one vessel at a time, but only for the smallest vessels, and this occurred only once in 2015-16.
- The Overseas Passenger Terminal is already experiencing high utilisation during peak season, and there will be a small (and decreasing) number of slots available over the next five years (refer to Figure 10). These are currently available because they are not popular slots. It is clear that the Terminal is already heavily constrained for access by vessels that have no alternative (because they cannot pass under the Harbour Bridge). The terminal may reach full capacity as soon as the 2017 peak season, and by the end of the next five-year period it could be fully utilised during peak and shoulder seasons.
- We have been advised by the Port Authority that there would be a small increase in occupancy costs if two vessels were to occupy the Overseas Passenger Terminal in one 24-hour period. This advice does not indicate variable costs related to passenger numbers, however (it relates to a possible change in bookable slot length).

- A boarding fee (for the pilot) is currently applied to all vessels, and is currently a fixed charge.
- The methodology currently used was included in the 2012/13 fee restructure by the Sydney Ports Corporation, which introduced a passenger-based charge to replace a length-of-occupancy charge.

  The Port Authority noted in its submission to IPART that the new approach was adopted because it would provide greater cost certainty for cruise operators, and adds that this represents a sharing of demand risk between the cruise operators and the Terminal operator. This approach appears to be in common use in the international cruise industry.
- The Port Authority currently issues several invoices for services rendered during each call, with each service invoiced separately. The need to know passenger numbers means that the site occupancy charge cannot be invoiced until passenger numbers are confirmed, and involves additional administrative effort to process.
- There are arguments for and against the use of land valuation based on 'highest and best use'. The land valuation reports made available for this review indicate a significant difference in valuation between 'highest and best use' and 'existing use', which would translate to a significant difference in the potential cost recovery from cruise operators.

  Selection of the method to be used rests with IPART, but it is worth noting that the decision to allow land to be used for a purpose that is not 'highest and best use' lies with the State, and the State is entitled to determine that the value provided to it by cruise operations is such that a lesser use of the land is acceptable (since it could not obtain the value without allowing the land to be used for that purpose).

  The difference in value has been referred to as a 'subsidy' (during the public forum and in submissions), but in practice it is a rational trade-off for the State and should have no impact on Port Authority cost recoveries.

We draw a number of conclusions from this analysis:

- It is not cost-reflective to use passenger numbers as a basis for allocating terminal costs because the cost of the Terminal is, in practice, fixed.
- It would be feasible to recover the capital used for the recent expansion of the Overseas Passenger Terminal from vessels carrying more than 2,500 passengers (via a surcharge) – this possible change would have affected 16% of calls during 2015/16, primarily international ships. The surcharge would be small, however, and it would be simpler to have a single charge and accept the slight cross-subsidy implied.
- The Port Authority (via the Sydney Ports Corporation) has accepted a revenue risk (related to passenger numbers) that it has no ability to manage and which it should therefore not have to carry.
- The cruise operators have been offered a per-passenger fee for site occupancy, but affects only one part of the set of charges that are incurred by a vessel visiting the Harbour, the rest of which are primarily tonnage-based. It can be of only limited value to have one charge element in a form that can be directly related to the cost of a cruise for a passenger, if the other elements are not in that form. We note that a per-passenger fee increases costs for large vessels (compared to a per-vessel approach), and where berth access is increasingly constrained, larger vessels should be encouraged, not penalised.
- A resource scarcity basis for charges could be applied via:
  - A bidding mechanism, which none of the stakeholders favour.
  - A move to 12-hour slots, which would have the effect of reducing occupancy charges for vessels able to occupy the Overseas Passenger Terminal for 10 hours or less (allowing time for vessels to pass at Fort Dennison) and increasing charges for other vessels. This approach would benefit home port vessels, and increase charges for international vessels (which typically take 24 hour slots now).

    This approach would immediately increase the number of available (12-hour) slots, allowing investment in other berthing alternatives to be deferred a decade or longer.
- A fixed fee for a slot would be cost reflective and avoid cross-subsidy between vessels.

In the absence of a demonstrable link between the cost of the service and the number of passengers, we conclude that the current approach penalises larger vessels, and represents a small cross-subsidy from them to smaller vessels.

The cost of site occupancy must be recovered from vessels using the terminal, and we conclude that the most reasonable approach would be by using a fixed charge per slot.

5.5 Miscellaneous Charges

Charges for security and cleaning are passed through to customers at cost, and are therefore not analysed in this section on the understanding that IPART is not required to examine this arrangement. All 'residual' charges are rolled into site occupancy costs and are therefore recovered through the site occupancy charge.

5.6 Conclusions

There is an opportunity to simplify the charging regime as well as ensure that it is cost-reflective. Recognising that all costs are fixed, the variable to be considered in charging is the number of vessels. If this simple basis were to be adopted, it would be possible to establish a single fee for all vessels using the Harbour. This charge would be advised in advance of the visit and therefore be available to operators when establishing cruise fees for passengers. It should be possible to rationalise invoicing further to single, consolidated invoices for each operator covering all visits during each month.

6.0 Transition to Cost Efficiency

This review has not found any opportunities for the Port Authority to materially improve its cost efficiency, noting that it has undertaken a serious and successful review of its cost structures since it was established in 2014.

We have noted that the invoicing process used is cumbersome and complex, reflecting the way in which charges are currently defined. It does not seem necessary to issue multiple invoices for each call, most raised only a day or two apart, where the Port Authority's terms of payment are 28 days.

There is an opportunity to rationalise this administrative activity and realise a small operational saving. This would be more significant if the charging structure itself could be simplified, to the point where it would be feasible to issue one (itemised) invoice only per call.

We note, however, that the cost saving would not be material.

We have noted that there may be an opportunity to reduce turnaround times for home port vessels using the Overseas Passenger Terminal, and that this could provide substantial short to medium term relief by increasing capacity. Royal Caribbean noted in its submission to the Tribunal that there are ports where the 'curb to cabin' transition is as short as 15 minutes, considerably quicker than its experience at the OPT. It is possible that a re-configuration of OPT could improve the Port Authority's performance in this area, and we recommend that this opportunity be investigated.

Since the Port Authority's costs are largely fixed, being able to berth more vessels would increase returns on investment for the Port Authority while also enabling a reduction in site occupancy charges at the Terminal.

Appendix A

Reference Documents

Appendix A Reference Documents

Project Number	60504434
Project Name	IPART Cruise Ship Pricing Review

AECOM Ref	Document	Format	In/Out	From
S00002	Proposed Booking Protocol	pdf	In	IPART
S00003	Ferrier Report 1997	pdf	In	IPART
S00004	IPART Template Final V2.0.19	pdf	In	IPART
S00005	Miscellaneous Charges_Passenger	pdf	In	IPART
S00006	Pass db 13-14 15-16	pdf	In	IPART
S00007	Strategic Assessment Plan	pdf	In	IPART
S00008	Summary of channel fee arragement	pdf	In	IPART
S00009	161966_Final-MSIP 2010 Sydney Harbour Visual Inspection	pdf	In	IPART
S00010	171169-MSIP 2011 Diving Inspection Sydney Harbour Assets	pdf	In	IPART
S00011	182196 - OPT Caissons & Mooring Bollards L3 Investigation	pdf	In	IPART
S00012	185628-MSIP 2012 Level 3 White Bay & Glebe Island 2013	pdf	In	IPART
S00013	S00013 160506 - Draft Project Fare report	pdf	In	IPART
S00015	S00015 PPSPPilotageRatesJuly2015	pdf	In	IPART
S00018	S00018 WB 3 - Cross Section	pdf	In	NSWPA
S00019	S00019 WB 3 - Cross Section_2	pdf	In	NSWPA
S00020	S00020 WB 3 - Foundations	pdf	In	NSWPA
S00021	S00021 WB 3 - Overview	pdf	In	NSWPA
S00022	S00022 WB 3 - Pavement	pdf	In	NSWPA
S00023	S00023 WB 5-6 - Concrete	pdf	In	NSWPA
S00024	S00024 WB 5-6 - Cross Section	pdf	In	NSWPA
S00025	S00025 WB 5-6 - Foundations	pdf	In	NSWPA
S00026	S00026 WB 5-6 - Overview	pdf	In	NSWPA
S00027	S00027 WB 5-6 - Pavements	pdf	In	NSWPA
S00028	S00028 WBCT - Cross Section- 1	pdf	In	NSWPA
S00029	S00029 WBCT - Cross Section- 2	pdf	In	NSWPA
S00030	S00030 WBCT - Overall - 3D	pdf	In	NSWPA
S00031	S00031 WBCT - Overall	pdf	In	NSWPA
S00032	S00032 01 PANSW Valuation Report 2015 final v0.1	pdf	In	NSWPA
S00033	S00033 02 WB4n5 specialised assets reval 2012	pdf	In	NSWPA
S00034	S00034 03 LPI Valuation Report - OPT Passenger Terminal - June 2010	pdf	In	NSWPA

AECOM Ref	Document	Format	In/Out	From
S00035	S00035 04 OPT specialised assets reval 2012	pdf	In	NSWPA
S00036	S00036 alw12344	pdf	In	NSWPA
S00037	S00037 Moores - Building GA	pdf	In	NSWPA
S00038	S00038 Moores - Building GA_2	pdf	In	NSWPA
S00039	S00039 Moores - Drainage	pdf	In	NSWPA
S00040	S00040 Moores - Drainage-2	pdf	In	NSWPA
S00041	S00041 Moores - Emergency Response Jetty Concrete	pdf	In	NSWPA
S00042	S00042 Moores - Emergency Response Jetty Fenders	pdf	In	NSWPA
S00043	S00043 Moores - Emergency Response Jetty GA	pdf	In	NSWPA
S00044	S00044 Moores - Floating Jetty GA	pdf	In	NSWPA
S00045	S00045 Moores - Level 1-2 Elec and layout	pdf	In	NSWPA
S00046	S00046 Moores - Overview	pdf	In	NSWPA
S00047	S00047 Moores - Pavement	pdf	In	NSWPA
S00048	S00048 Moores - Survey Jetty Cross Section	pdf	In	NSWPA
S00049	S00049 Moores - Survey Jetty GA	pdf	In	NSWPA
S00050	S00050 Moores - Wharf Cross Section	pdf	In	NSWPA
S00051	S00051 Moores - Wharf Cross Section_2	pdf	In	NSWPA
S00052	S00052 OPT Building Cross Section	pdf	In	NSWPA
S00053	S00053 OPT Building Layout	pdf	In	NSWPA
S00054	S00054 OPT Building Layout-Ground	pdf	In	NSWPA
S00056	S00056 OPT Building Location	pdf	In	NSWPA
S00057	S00057 OPT Wharf Caissons	pdf	In	NSWPA
S00058	S00058 OPT Terminal Bld Layout Plans	hard copy	In	NSWPA
S00059	S00059 Copy of Questions and follow up information request 050516 v3	xlsx	In	IPART
S00060	S00060 Passenger Database FY16	xlsx	In	IPART
S00061	S00061 Questions 9-13	dcox	In	IPART
S00062	S00062 IPART template FINAL STAND ALONE v1.0 19 Apr 16	xlsx	In	IPART
S00063	S00063 Allocation drivers Final v6 0 20 Apr 16 CALLS VERSION	docx	In	IPART
S00064	S00064 Port Authority IPART Submission 6 May 2016	link	In	IPART
S00065	S00065 Cruise Pricing - Government Preso 2 November 2011 V1 0 Final	pptx	In	IPART
S00066	S00066 Questions and follow up information request 050516 v2	xlsx	In	IPART
S00067	S00067 Corporate OH Loading	xlsx	In	IPART
S00068	S00068 Project Expenditure Request Form_CR GANGWAY Replacement	docx	In	IPART
S00069	S00069 Abstract from FFER Project Initiation Doc	docx	In	IPART

AECOM Ref	Document	Format	In/Out	From
S00070	S00070 Savings and Commitments_Revised Bus Plan in FY2014 and FY2015	dcox	In	IPART
S00071	S00071 SPC Post Port Botany Transaction Review	docx	In	IPART
S00072	S00072 Additional Costs for 2 x 12hr slots	email	In	IPART
S00073	S00073 Helicopter Transfers	email	In	IPART
S00074	S00074 Valuer Response to AECOM queries	emaiol	In	IPART
S00075	S00075 Terminal Operating Costs	xlsx	In	IPART
S00076	S00076 WB Terminal background	email	In	IPART
S00077	S00077 Allowable Capacity in OPT buildings	email	In	IPART
S00078	S00078 Questions and follow up information request 050516 v2	xlsx	In	IPART
S00079	S00079 Port Botany - Channel User Licence Agreement signed	pdf	In	IPART
S00080	S00080 Harbour Master Directions	pdf	In	PA NSW
S00081	S00081 1857 Survey	tiff	In	NLA
S00082	S00082 Copyright info for S00081	pdf	In	NLA
S00083	S00083 Maritime - Value of Dredged Assets (30 June 2011)	pdf	In	IPART

Appendix B

Assets Used in Service Delivery

Appendix B Assets Used in Service Delivery

The physical assets included within the asset areas are generally found across three sites within Sydney Harbour which are:

- Overseas Passenger Terminal (OPT)
- White Bay
- Moores Wharf.

Figure 17 shows the location of these sites:

Figure 17 Sydney Harbour, showing major PANSW asset locations

The assets are then categorised by asset class which are listed below:

- Plant
- Buildings
- Reclamations
- Navigation Aids
- Furniture and Fittings
- Wharves and Jetties
- Motor Vehicles
- Lighthouses
- Outdoor Plant
- Seawalls
- Computer Hardware
- Intangibles
- Moorings
- Computer Software
- Roadways
- Buildings Under Construction
- Plant - WIP
- Outdoor Plant - WIP
- Furniture and Fittings Under Construction
- Computer Hardware Under construction
- Seawalls - WIP
- Wharves and Jetties - WIP
- Leased Buildings - Renovations

Navigation Assets

Navigation and 'Piloting' assets share a number of built assets at Moores Wharf with the Book Values being apportioned as follows:

Table 4 Moores Wharf asset allocation between Navigation and Piloting

	Navigation	Piloting
Buildings	80%	20%
Wharves & Jetties	80%	20%
Plant	80%	20%

Error! Reference source not found. The most significant assets (represent at least 10% of the 'Area' book value) are Plant, Buildings, Reclamations and Navigation Aids.

Plant assets consist generally of Vessels, Cranes and Radar which are used to support the Navigation function within the Port.

Building assets include the heritage listed Moores Wharf building which also services PANSW Corporate assets, namely IT and the backup control room. We note that the asset register includes a 'shed' at Moores Wharf which has now been removed from the site due to the Barangaroo Redevelopment.

Reclamation assets we understand are historic land reclamation costs which have been escalated to current day cost. These costs are not depreciated as they have been treated similar to a land asset which is reported at book value and not depreciated.

Navigation Aids include land based leads, marine light houses and piled marine lights as well as buoys. There are some heritage-listed aids. We have included aids that are relevant to cruise shipping only, i.e. those needed to enable navigation through the heads, along the eastern and western channel, to Sydney Cove and beyond to White Bay.

Although not significant or 'material' in terms of book value, the 'Wharves and Jetties' assets are significant in terms of being enablers to Service Delivery.

Figure 18 shows the Moores Wharf site and identifies the buildings, major 'fixed' plant, jetties and wharfs located on site.

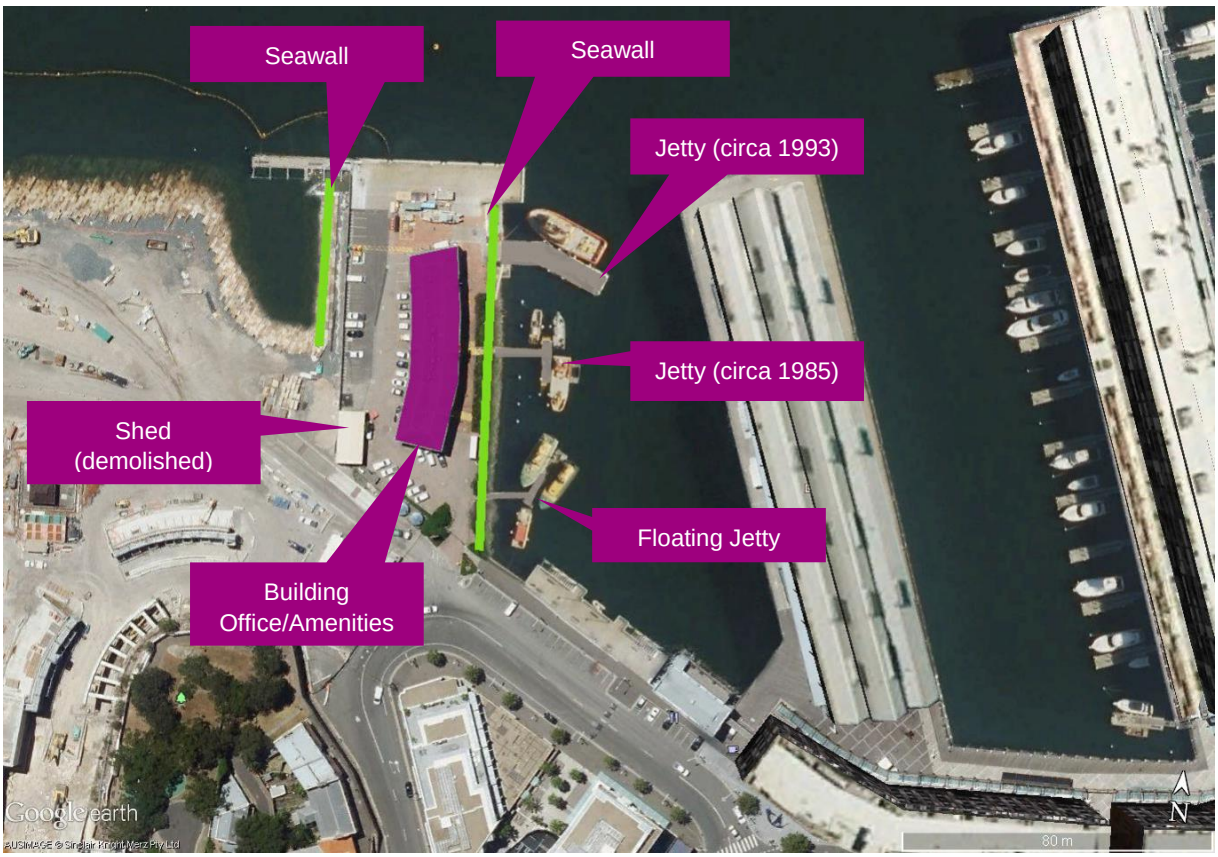

Figure 18 Moores Wharf Site Plan

Piloting Assets

Error! Reference source not found. The most significant assets (by book value) are Plant, Reclamations and Buildings.

Plant assets consist generally of the Pilot vessels and vessel engines (which have been recognised separately due to the material value in relation to the vessel.)

Reclamation assets as noted in Navigation.

Building assets as noted in Navigation.

Although not significant in terms of book value, the 'Wharves and Jetties' assets are significant in terms of being enablers to Service Delivery.

The location of these assets is shown in Figure 18.

White Bay Terminals 4 & 5 Assets

As Terminals 4 & 5 are adjacent to each other and largely similar in nature so we have included both asset areas within this section.

The most significant assets are Buildings, Reclamations, Outdoor Plant and Plant.

Building assets include the recently constructed (2013) purpose built White Bay Cruise Terminal (WBCT) and several small office and amenities buildings.

Reclamation assets we understand are historic land reclamation costs which have been escalated to current day cost. These costs are not depreciated as they have been treated similar to a land asset which is reported at book value and not depreciated.

Outdoor Plant generally comprises of the two gangways and the steel frame of the previous gantry crane which was retained during the development of the WBCT.

Plant assets include the engineering plant and equipment within the WBCT building.

Although not significant or 'material' in terms of book value, the 'Wharves and Jetties' assets are significant in terms of being enablers to Service Delivery. We note that the wharves were designed and constructed for container and bulk cargo use.

Figure 18 shows the White Bay site and identifies the major asset elements.

Figure 19 White Bay Site Plan

Overseas Passenger Terminal Assets

The OPT includes a number of retail tenancy spaces which have previously been included the asset value which was then offset by apportionment of the tenancy income.

The OPT recently underwent a significant redevelopment with elements of the work still noted as "Work in Progress" on the asset register, however upon our site inspection we note that all works are complete.

The most significant assets are Buildings, Plant, Reclamations and Wharves and Jetties.

The Buildings category includes the 1958 Overseas Passenger Terminal building and the redevelopment works (2015) associated with the building.

Plant assets include the plant and equipment within the OPT, building glazing, aerobridge gangways, fenders and Cathodic Protection to the wharf.

Reclamation assets we understand are historic land reclamation costs which have been escalated to current day cost. These costs are not depreciated as they have been treated similar to a land asset which is reported at book value and not depreciated.

Wharves and Jetties assets include caissons, sheet pile walls, piles and paving's.

A stone seawall is also included within the OPT asset register as shown in blue on Figure 20. It could be argued that the asset contributes little to cruise ships; however the value of the asset is not material in terms of the overall OPT asset base.

Figure 20 shows the OPT site and identifies the buildings, major 'fixed' plant, jetties and wharfs located on site.

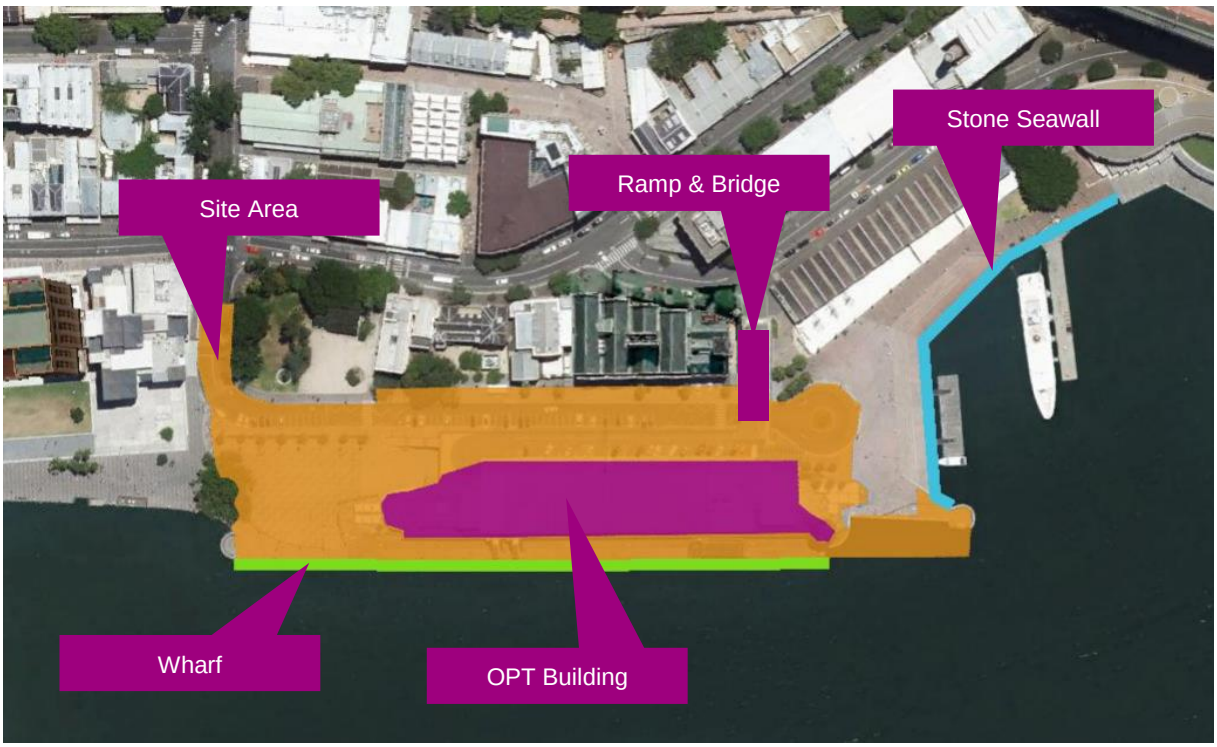

Figure 20 OPT Site Plan

We note that the access ramp and bridge to connect the road to level 2 of the OPT is not recognised in the asset register even though it is a significant asset. We have included the asset within our assessment of the asset values.

Appendix C

Overview of the Methodology Used in the Review

Appendix C Overview of the Methodology Used in the Review

The methodology adopted is outlined in the Figure 21.

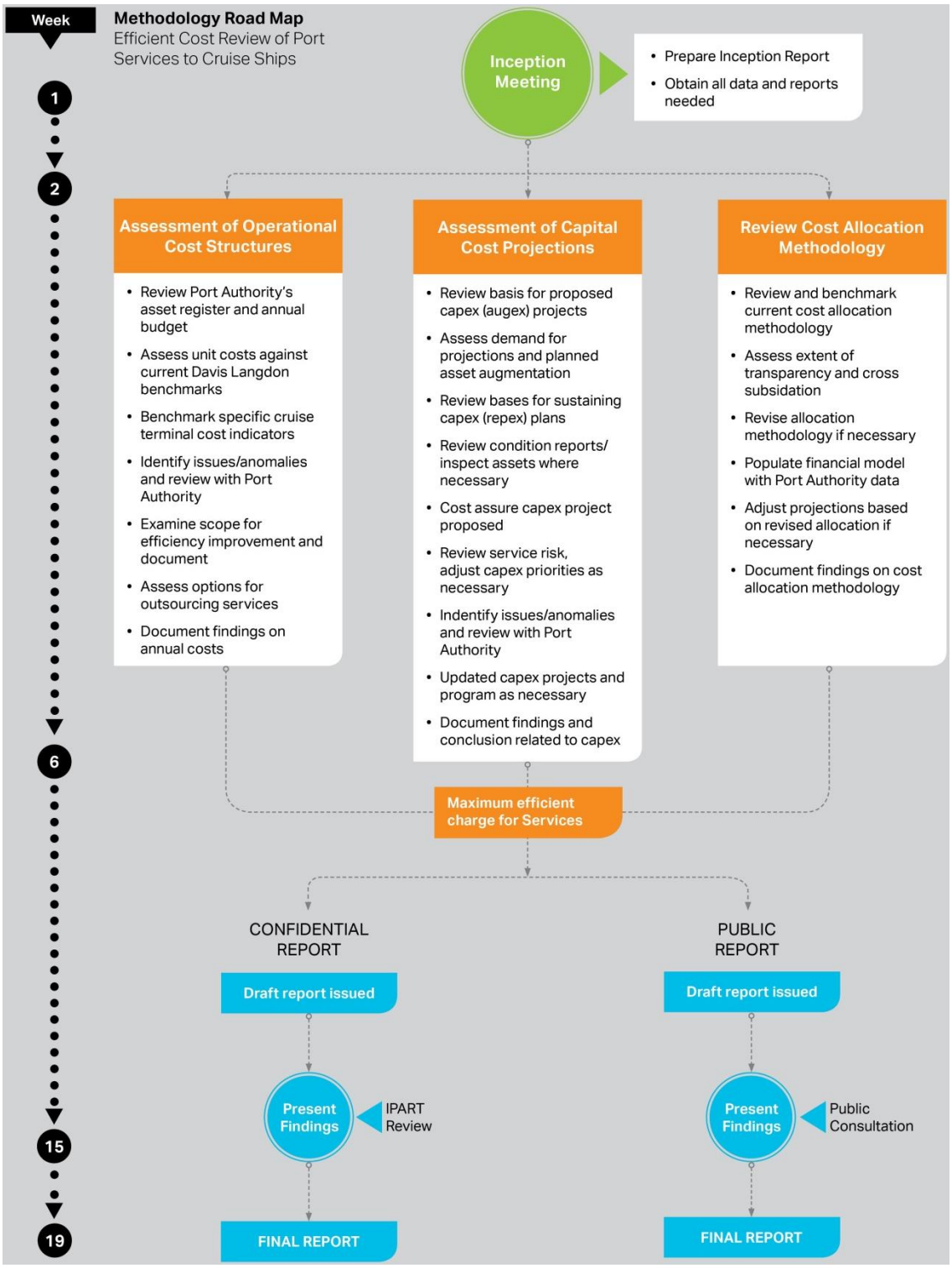

Figure 21 Outline of Methodology